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USAID STRIDE

# Philippines Innovation Ecosystem Assessment 2019 Update

March 2020



"One of the most dramatic developments of the past 30 years has been emerging Asia's soaring consumption and its integration into global flows of trade, capital, talent, and innovation. In the decades ahead, Asia's economies will go from participating in these flows to determining their shape and direction. Indeed, in many areas—from the internet to trade and luxury goods—they already are. The question is no longer how quickly Asia will rise; it is how Asia will lead. Of course, it is hard to generalize about such a vast swathe of the world, spanning myriad languages, ethnicities, and religions. These nations have widely varying forms of government, economic systems, and human-development indicators."

—*Asia's future is now*. McKinsey Global Institute, 2019

**Has the innovation ecosystem in the Philippines improved in the last 5 years?**

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## Post COVID-19

The research for this report was completed in 2019, and the report was prepared for publication in March 2020. Due to the global pandemic caused by the COVID-19 virus, the release of the report was delayed. Prior to release the authors revisited the findings and recommendations and considered them in light of the impacts of the virus, including economic outlooks, supply chains, educational realities, and research limitations. Even with the global implications of the virus still developing, the authors believe that the conclusions of this report still hold and offer value as the Philippines considers how to emerge from the crisis and regain both local and global economic footing.

# DEFINITIONS AND ACRONYMS

**Innovation** is “a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).”<sup>1</sup> An **innovation ecosystem** “models the economic ... dynamics of the complex relationships ... between actors or entities whose functional goal is to enable technology development and innovation.”<sup>2</sup>

ASEAN	Association of Southeast Asian Nations
BIST	Business Innovation through S&T
BPO	Business Process Outsourcing
CDO	Cagayan de Oro
CHED	Commission on Higher Education
CMO	CHED Memorandum Order
COA	Commission on Audit
CRADLE	Collaborative Research and Development to Leverage Philippine Economy
DepEd	Department of Education
DICT	Department of Information and Communications Technology
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
FDI	Foreign Direct Investment
FEC	Filipinnovation Entrepreneurship Corps
FOB	Fairness Opinion Board
GDP	gross domestic product
GII	Global Innovation Index
GTCI	Global Talent Competitive Index
HEI	higher education institution
HEIRIT	Higher Education Institution Readiness for Innovation and Technopreneurship
IP	intellectual property
IPOPHL	Intellectual Property Office of the Philippines
ITSO	Innovation & Technology Support Office
KTTO	Knowledge and Technology Transfer Office
LGU	local government unit
MOA	memorandum of agreement
MOU	memorandum of understanding
MSME	micro, small, and medium enterprise
NCR	National Capital Region
NEDA	National Economic and Development Authority
NIC	National Innovation Council
NICER	Niche Centers in the Regions for R&D
OECD	Organisation for Economic Co-operation and Development
PBEd	Philippines Business for Education
PCIEERD	Philippine Council for Industry, Energy, and Emerging Technology R&D
PHP	Philippine peso
PIA	Philippines Innovation Act
R&D	research and development
RDLead	R&D Leadership Program
RIIC	Regional Inclusive Innovation Center
S&T	science and technology
S4CP	Science for Change Program
SME	small and medium-sized enterprises
STEM	science, technology, engineering, and mathematics
STRIDE	USAID/Philippine Science, Technology, Research and Innovation for Development Program
TBI	Technology Business Incubator
TESDA	Technical Education and Skills Development Authority
TLO	Technology Licensing Office
UM	utility model
USAID	United States Agency for International Development

1. OECD/Eurostat. (2018), *Oslo manual 2018: Guidelines for collecting, reporting and using data on innovation* (4<sup>th</sup> ed.), The Measurement of Scientific, Technological and Innovation Activities. Paris/Eurostat, Luxembourg: OECD Publishing. Retrieved from <https://doi.org/10.1787/9789264304604-en>
2. Jackson, D. (2011). What is an innovation ecosystem? Arlington, VA: National Science Foundation. Retrieved from [https://www.researchgate.net/publication/266414637\\_What\\_is\\_an\\_Innovation\\_Ecosystem](https://www.researchgate.net/publication/266414637_What_is_an_Innovation_Ecosystem)

USAID STRIDE

# Philippines Innovation Ecosystem Assessment

2019 Update

**70**  
in-depth  
interviews

literature  
review  
**2014 –  
2019**

**249**  
survey  
responses

This report was prepared for the United States Agency for International Development (USAID), as part of the USAID/Philippines' Science, Technology, Research and Innovation for Development (STRIDE) Project with support from RTI International Innovation Advisors. STRIDE's mission is to strengthen science, technology, and innovation capacity for inclusive growth in the Philippines.

## EXECUTIVE SUMMARY



FIGURE 1

A total of 319 individuals provided input for this innovation ecosystem assessment: 70 in-depth interviews, and 249 survey responses.



FIGURE 2

The majority of assessment participants believe that the Philippines innovation ecosystem has improved since 2014.

This Philippines Innovation Ecosystem Assessment 2019 Update reports on changes to the innovation ecosystem since the 2014 “inaugural” assessment.<sup>3</sup> The 2014 assessment focused on characterizing and evaluating the Philippines ecosystem, whereas this assessment’s objective is to highlight relevant activities and developments from 2014 to 2019, with a focus on the perceptions of ecosystem stakeholders of both intentional and serendipitous changes. The findings presented in this study result from collecting and analyzing input from over 300 individuals across various organizations in multiple regions of the Philippines — see FIGURE 1. Stakeholder perspectives were captured for government, industry (including startups), and both public and private universities.

This assessment, like the 2014 effort, is not intended to be an authoritative statement on the innovation ecosystem, nor a reflection of the opinions of USAID, or the USAID/Philippines’ STRIDE Project. This report, like the 2014 assessment, was commissioned by and prepared for USAID, as part of the USAID/STRIDE Project with support from RTI International Innovation Advisors. STRIDE’s mission is to strengthen science, technology, and innovation capacity for inclusive growth in the Philippines.

In general, stakeholders reported improvement in innovation-related activities since 2014, as shown in FIGURE 2. Indicators of improvement relate to the key elements of an innovation ecosystem: human capital and education, creation and transfer of knowledge (e.g., research, invention, product development, licensing of intellectual property), the entrepreneurial community (e.g., entrepreneurs, funding, mentors), and collaboration (both within and across stakeholder groups including academia, industry, and government). These findings are well in alignment with the latest ranking of the Global Innovation Index (GII), which placed the Philippines 54<sup>th</sup> out of 129 economies that were ranked in 2019.<sup>4</sup> This is a significant jump from 2014, when the Philippines ranked 100<sup>th</sup> in the index.<sup>5</sup> Stakeholders often attributed improvements in various ecosystem elements to factors such as

- Intentional interventions from government
- Increased focus from academia to align with industry
- Industry’s increased openness and willingness to collaborate with academia on human capital development (shape curricula) and to some extent research and development (R&D)






TABLE 1 summarizes the findings from both the 2014 and the 2019 research efforts. Additional insights on 2014 scores are presented in CHAPTER 2, and CHAPTER 3 offers greater detail from the 2019 research.

3. RTI International. (2014). Philippine Innovation Ecosystem Assessment. Retrieved from [www.stride.org.ph](http://www.stride.org.ph)

4. Cornell University, INSEAD, and WIPO. (2019). The Global Innovation Index 2019: Creating Healthy Lives—The Future of Medical Innovation. Cornell University, INSEAD, and WIPO: Ithaca, Fontainebleau, and Geneva. Retrieved from [https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

5. Cornell University, INSEAD, and WIPO. (2014). The Global Innovation Index 2014: The Human Factor In innovation, second printing. Cornell University, INSEAD, and WIPO: Fontainebleau, Ithaca, and Geneva. Retrieved from [https://www.wipo.int/edocs/pubdocs/en/economics/gii/gii\\_2014.pdf](https://www.wipo.int/edocs/pubdocs/en/economics/gii/gii_2014.pdf)

TABLE 1 Summary of Findings: 2014 and 2019 Assessments

Innovation Ecosystem Element	2014	2019
<b>Human capital and education</b> 	<p>Scored supply of talent as moderate, demand as weak, and the enabling environment as good.</p>	<p>Government stakeholders believe they are making strides in improving human capital and education. High-profile programs such as the Balik Scientist Act are attempting to bring back Filipino graduates, and academia is starting to work with industry on curriculum development. Industry agreed that the number of graduates has increased, and data suggest this increase is particularly true in STEM fields.</p> <p>Academia and industry stakeholders thought that more support and faster action from government are needed to further improve human capital. “Brain drain,” referring to STEM graduates leaving the country to seek employment elsewhere, is still a challenge. While talent has improved, academia is still not fully aligned with the needs of employers or aimed at/enabled adequately for meaningful applied research.</p>
<b>Research and knowledge creation</b> 	<p>Scored supply of R&amp;D as moderate, demand as weak, and the enabling environment as poor.</p>	<p>Both government and academia believe that research and knowledge creation have improved significantly; the supply of research and the enabling environment have definitely improved. Interest in research is growing as evidenced by more widespread understanding of its importance and stronger connections between industry and academia. Government-funded programs/facilities are expanding, especially outside of the National Capital Region (NCR) and into the provinces, something that was highlighted as a challenge in 2014.</p> <p>The impact of the improvements related to research may take more time to be evident, and industry stakeholders registered only minimal change. Industry-funded research or licensing from universities to industry remains rare.</p>
<b>Knowledge transfer</b> 	<p>Scored supply and demand both as weak and the enabling environment as moderate.</p>	<p>Knowledge transfer is improving, especially in terms of supply. Many universities are now connecting to industry to emphasize valuable research areas and to protect and leverage intellectual property (IP). Both academia and government were optimistic that knowledge transfer will continue to improve, especially given the recent push from government to establish more offices around the country, including Intellectual Property Offices (IPOs) and Knowledge and Technology Transfer Offices (KTTOs).</p> <p>More awareness of IP as a tool for knowledge transfer is needed, and the total level of patenting and licensing remains low.</p>
<b>Startups and spinoffs</b> 	<p>Scored supply and the enabling environment as weak and demand as moderate.</p>	<p>All interviewed stakeholders agreed that the innovation ecosystem and society at large have shown increased interest in entrepreneurship, and a higher number of startups have been created.</p> <p>Although entrepreneurship is more popular now, science and technology (S&amp;T) spinoffs are still rare. Many gaps need to be addressed for the startup scene to be globally competitive. Regulatory barriers still exist, and the ecosystem needs higher availability of risk capital. High-profile startup exits are also needed to continue to drive growth and interest, as well as a larger base of real experience to help increase interest and success via serial entrepreneurship and mentorship.</p>
<b>Collaboration</b> 	<p>Scored this factor as poor overall.</p>	<p>Most stakeholders believe collaboration between government and academia is strengthening, as is the link between academia and industry. Cross-government collaboration is also improving, involving Departments of Science and Technology (DOST), Information, Communications and Technology (DICT), and Trade and Industry (DTI).</p> <p>A positive sentiment is associated with collaboration, but the absolute level of collaboration is still limited. The linkage between the Commission on Higher Education (CHED) and the rest of the innovation ecosystem is still weak according to industry and academia. Stakeholders also reported the link between government and industry remains mostly unchanged. Many interviewees from industry were unaware of key stakeholders and programs in the ecosystem, much less opportunities to partner with them.</p>

Beyond the analysis of the key elements of an innovation ecosystem, 4 challenge areas were identified in 2014: procurement regulations, cofunding structures, inflated patent licensing revenue expectations, and the environment of mistrust. Three of them have improved significantly, but procurement regulations remain a major barrier to innovation.

#### Commentary specific to challenges identified in 2014:

- **Procurement regulations**—The few stakeholders from academia that saw improvement in this area over the past 5 years attribute the improvement to self-directed efforts to implement processes or find ways around the major barriers.
- **Cofunding structures**—Interviews revealed that the ecosystem has seen some improvement in this area, and much of it can be ascribed to academia's efforts in developing guidelines and establishing processes to collaborate with industry.
- **Inflated patent licensing revenue expectations**—Opinions from academia were mixed regarding the government's decision to establish a Fairness Opinion Board (FOB). Some believe having external input is helpful to the licensing process, but others see this board as an additional step in an already lengthy process. Further delays in the licensing process can be a real detriment to the successful execution of a license and/or the implementation of IP. The government, including DOST, is aware of the challenge and stated they are working to address it. Opportunities to license to industry are few, and the added delay in the transfer process further reduces industry's interest.
- **Environment of mistrust**—The environment has seen significant improvement in developing networks among stakeholders; however, industry is still seeking better and more frequent opportunities to benefit from working with government.

#### The remaining challenges of note for 2019 include:

- **Procurement regulations** remain a challenge. Science, research, and development are often limited by administrative burden, delays, and access to equipment and supplies. Procurement issues translate into reticence by industry to collaborate.
- **R&D investments and mechanisms** are still needed to enable R&D talent, awareness, and access (e.g., industry research with government funding). R&D enablers are especially needed to increase innovation toward new products and services by industry both in the Philippines and globally.
- **Collaboration**, across stakeholder groups as well as across government agencies, needs to continue to improve beyond coordination to real collaboration with holistic goals and mutually beneficial outcomes.
- With the increased investments toward innovation in education and programs, there needs to be parallel investment to drive uptake by **raising awareness about opportunities and reducing barriers to participation**.
- The interest in entrepreneurship is increasing but **local success examples are needed** to solidify it as a valid investment option and career choice, which will then strengthen the environment with resources to generate more successful startups and spinoffs with real long-term impact.

The basis behind these key challenges, as well as insights on areas of improvement and perceptions on the drivers, is discussed in greater detail in this 2019 assessment.

<b>CHAPTER 1</b>	shares the research methodology
<b>CHAPTER 2</b>	provides context with an examination of legislation, policies, and programs
<b>CHAPTER 3</b>	summarizes the 2019 research findings as well as impacts in the form of global rankings
<b>CHAPTER 4</b>	offers brief conclusions and recommendations
<b>APPENDICES</b>	include a list of organizations interviewed (APPENDIX A), survey questions (APPENDIX B), criteria by factor (2014: APPENDIX C; 2019: APPENDIX D), comparison between 2014 and 2019 (APPENDIX E), and detailed graphics used in the analysis (APPENDIX F).

Through the combination of interviews and survey, the research found an overall positive perspective on the progress made toward a stronger innovation ecosystem. Respondents noted improvement over 68 percent of the time, while indicating no significant change 28 percent of the time and a negative perspective on change less than 4 percent of the time. Science, technology, and innovation play a key role in the Increasing Growth Potential pillar of the Philippine Development Plan (PDP) 2017–2022,<sup>6</sup> and indicate that many aspects of the innovation ecosystem will continue to improve in 2020 and beyond.

In looking at the changes from 2014 to 2019 and gaining significant insights from stakeholders, the assessment recognizes that new government and university programs have been developed to address challenges such as establishing industry connections to government and academia; spurring entrepreneurship, education, human capital, research quality, and output; and enabling knowledge transfer and collaboration. To address the remaining challenges and enable successful programs with greater impact, the planning, funding, and functions of agencies and programs need to more cohesively align with the overarching strategy (PDP) and be measured on an ongoing basis against a baseline and toward the defined goals.

6. National Economic and Development Authority. (2017). Philippine Development Plan 2017-2022. Retrieved from [http://www.neda.gov.ph/wp-content/uploads/2017/12/Abridged-PDP-2017-2022\\_Final.pdf](http://www.neda.gov.ph/wp-content/uploads/2017/12/Abridged-PDP-2017-2022_Final.pdf)

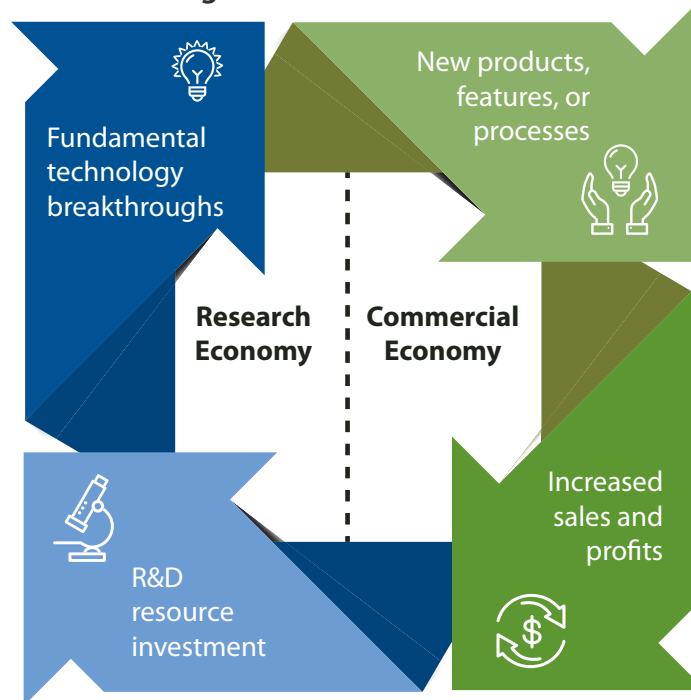
# CHAPTER 1: METHODOLOGY

## Background

Growth of an innovation ecosystem requires two distinct but interdependent systems: the knowledge economy (driven by fundamental research often funded by government and executed by academia or industry) and the commercial economy (driven by the marketplace), as illustrated in [FIGURE 3](#). For an innovation ecosystem to grow and be self-sustaining, two conditions must hold:

1. A percentage of profits from the commercial sector must be channeled to investments in (fundamental) research, either through direct expenditures or via taxation that provides government funds to be allocated for research.
2. Innovation-induced growth in the economy (additional profits in the commercial economy) is larger than the original investments. The reinvestment of a percentage of these increased profits back into research creates a virtuous cycle and promotes a healthy innovation ecosystem.<sup>7</sup>

FIGURE 3 A thriving innovation ecosystem is a virtuous cycle where innovative products and services provide investment and knowledge for R&D.



To achieve a growing cycle is a challenge because each step depends highly on the institutions (mechanisms, organizations, actors, and governance arrangements) that compose the ecosystem. Each country has a different mix of institutions to facilitate the journey from fundamental research to commercial profitability, and because most technologies or innovations fail to complete this journey (>90 percent), the quality of these institutions is critically important.<sup>8</sup> Furthermore, when developing an ecosystem in middle-income countries new to the innovation process, very little can be assumed about which institutions are in place, how well they work, and whether they are contributing to the health and growth of the innovation ecosystem. Assessing the innovation ecosystem requires a coherent model, adaptable to widely varied national conditions.

<sup>7</sup> Jackson, D. (2011). What is an innovation ecosystem? Arlington, VA: National Science Foundation. Retrieved from [https://www.researchgate.net/publication/266414637\\_What\\_is\\_an\\_Innovation\\_Ecosystem](https://www.researchgate.net/publication/266414637_What_is_an_Innovation_Ecosystem)

<sup>8</sup> Payne, M. (2014). How to kill a unicorn: How the world's hottest innovation factory builds bold ideas that make it to market. New York, NY: Crown Publishing Group.

RTI International developed and uses the innovation ecosystem framework (see [FIGURE 4](#)) to help governments, businesses, and universities harness innovation for economic growth. The model was foundational to the research in 2014 and this updated assessment in 2019. It enables consideration of the key dynamic processes and the foundational contextual factor for success: collaboration. The ecosystem model illustrates the necessity of, and interplay between, fundamental elements:






















1. Education and human capital development
2. Research and knowledge creation
3. Direct collaboration between universities and industry through knowledge and technology transfer, in some cases enabled by intellectual property (IP)
4. An entrepreneurial environment that enables startup and spinoff companies
5. An environment for collaboration that includes trust and social capital, and enables sharing.

✓ **FIGURE 4** RTI's innovation ecosystem framework: Innovation is often described as an ecosystem because of the interrelated relationships of individuals and resources.



The 2014 assessment built on RTI's innovation ecosystem framework by constructing a scorecard reflecting all relevant factors. As illustrated in [FIGURE 5](#), each of the 16 cells of the scorecard contains a qualitative rating that was derived from interviews conducted by STRIDE in 2014 (70 individuals from 55 organizations, including Filipino and international business, government, academia, and nongovernmental organizations). These interviews were conducted with organizations from various regions of the Philippines, particularly Metro Manila, Cebu, and Cagayan de Oro. Each interviewee was presented with factors in the assessment model and asked to comment on those in which they had specific expertise or experience. Interviewers helped participants understand each factor with definitions and examples related to "supply," "demand," and the "enabling environment," as summarized in [APPENDIX C](#). Stakeholders were also asked to share their experiences, including successes and failures.

FIGURE 5 The 2014 assessment scored the innovation ecosystem variables on a 5-point scale.

Factor	Supply	Demand	Enabling Environment
Education and Human Capital Development			
Research and Knowledge Creation			
Transfer of Know-How between Universities and Industries (Extension)			
Intellectual Property: Protection, Licensing and Commercialization			
Startup and Spin-off Companies			
Collaboration: Knowledge Sharing, Trust, Social Capital			
<div><div>Key</div><div><div></div><div></div><div></div><div></div><div></div></div><div><div>Poor</div><div><div></div></div><div>Excellent</div></div></div>			

This 2019 effort intentionally built on the 2014 effort but also considered revisions to the process to quickly and efficiently gain insights specific to improvement and of relevance in 2019. Because the 2019 effort would not re-interview the same exact set of people, the data could not be longitudinal; thus, updating the scorecard was seen as potentially misrepresenting. Instead, the 2019 assessment used the same innovation ecosystem framework and focused on researching the following questions shown below. (See [APPENDIX D](#) for the 2019 Assessment Criteria.)

- What had occurred intentionally related to the key innovation ecosystem variables in the 5-year window?
- What were the perceptions associated with specific activities and impacts?
- How did these perceptions vary by role in the ecosystem (government, academia, large companies, startups)?

## 2019 Assessment Methodology

The 2019 process leveraged three main methods: (1) secondary research of the academic literature and the press to consider legislation, programs, and commentary related to innovation; (2) in-depth interviews to understand priorities, perceptions, and realities; and (3) an electronic survey aimed at specific stakeholder groups to gain a broad perspective on changes. The three methods, described below in more detail, combined to enable the research team to identify and analyze activities, perceptions, intentional impact, and serendipitous results across stakeholders including diverse government agencies, public and private universities, varying sized companies, as well as members of the entrepreneurial community.

## Review of Literature/Press

Secondary research considered the literature and the press associated with innovation policies, programs, and impacts from 2014 to 2019. This review and analysis identified and considered new laws enacted, new government initiatives, insights from studies/reports related to funding, impact, and other key innovation metrics (e.g., STEM graduates; patents; licenses; new tech-based startups; product launches from research/design efforts based in the Philippines). This assessment builds from the 2014 innovation ecosystem assessment, as well as assessments specific to agriculture and the high tech sector as shown in [FIGURE 6](#).

▀ **FIGURE 6** This assessment builds on the initial 2014 innovation ecosystem assessment and domain-specific studies executed by USAID/STRIDE between 2014 and 2019.<sup>9</sup>



## Interviews

RTI, with support from STRIDE, conducted 70 interviews with academia, government, and industry between April and August 2019. The majority of interviews were conducted in person during research trips to NCR, Cebu (Region VII), and Cagayan de Oro (Region X). The research intentionally re-interviewed selected organizations from 2014, which resulted in 24 organizations that participated in both studies. To drive for consistency across interviews (and interviewers), the research team designed and used a detailed interview instrument that built on the 2014 process and findings. Each interviewee was presented with the innovation ecosystem framework ([FIGURE 4](#)) and asked to prioritize and rank elements, and add relevant commentary. [APPENDIX A](#) contains the full list of organizations interviewed.

## Survey

The research team designed and launched a brief survey to understand the perception of stakeholders in relation to the changes to the innovation ecosystem from 2014 to 2019. The survey was anonymous to incentivize participation and nonbiased feedback. It was shared via several channels, including a direct campaign<sup>10</sup> via SurveyGizmo, Facebook, and Zimbra. Participants could respond between June and August 2019. In total, we received 249 responses. Participants were asked to provide input on the most important elements from the innovation ecosystem framework that applied to them and were given the option to expand further on changes between 2014 and 2019. They were also asked about changes to the cross-cutting challenges identified in the 2014 assessment. [APPENDIX B](#) provides the full list of questions.

9. RTI International reports. Philippines innovation ecosystem assessment (2014). Retrieved from <https://stride.org.ph/wp-content/uploads/2016/07/Full-Report.pdf>; Driving innovation to deliver economic value: A needs assessment of the Philippines' technology sector (2017). Retrieved from [https://stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector\\_UpdatedLayout.pdf](https://stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector_UpdatedLayout.pdf); Agribusiness innovation ecosystem assessment (2017). Retrieved from <https://stride.org.ph/wp-content/uploads/2019/03/PH-Agribusiness-Innovation-Ecosystem-Assessment.pdf>

10. The survey campaign was supported by the USAID STRIDE team, DTI, and SEIPI.

## CHAPTER 2: CONTEXT

Innovation is a hot topic globally, regionally in Southeast Asia, and locally in the Philippines. At all three levels, the literature and the press often hype innovation and cite associated deficiencies and needs that include government leadership in terms of strategy, policy, and funding.<sup>11</sup> This 2019 assessment considered the vast amount of literature and press surrounding innovation in the Philippines to inform and augment the direct feedback acquired via both interviews and a survey.

As recognized by the World Bank's recent research, economic development associated with productivity in the Philippines is currently constrained by factors related to deficiencies in infrastructure; however, the Philippine government has significantly increased associated planning and funding. Infrastructure needs and opportunity are associated with the following:

- High utility and trade costs (relative to regional peers) resulting from limited infrastructure and weak market competition in infrastructure markets;
- Average infrastructure connectivity (5<sup>th</sup> among Southeast Asian peers) associated with limited access to physical infrastructure. As such, the government has a \$180 billion national infrastructure plan, called "Build, Build, Build," with 75 projects related to airports, railways, roads and bridges, a seaport, as well as fiber optic cables and wireless technologies to improve internet speeds. There is also a Free *Wi-Fi Internet Access in Public Places* program (DICT) to provide public hotspots with the goal of 99 percent connectivity rate.<sup>12</sup>

Another area of opportunity and threat results from the continued emergence of artificial intelligence (AI). AI brings efficiency with computers to assist, augment, and/or replace humans. For the Philippines, the potential for AI to impact the business process outsourcing (BPO) sector is real and could translate to a significant number of lost jobs. A Pew Research Center survey found that robots and digital agents, costing only one-third of Philippine labor rates, will likely replace many BPO workers by 2025.<sup>13</sup> DTI, in collaboration with the Asian Institute of Management, is formulating an AI roadmap to help guide industry to embrace AI and work to position the Philippines as an AI hub. Industry 4.0 (i4.0) is the modern vernacular for leveraging embedded system production technologies and smart production processes to improve manufacturing efficiency and economics. Governments, companies, and universities globally are considering how to leverage and develop the next generation of i4.0 technologies, including sensors (many enabled by innovative materials), quality measurement/measurement/monitoring/calibration equipment and processes, and software/algorithms and decision systems, including cyber security.<sup>14</sup> Academia is taking steps to leverage i4.0 as seen through the launch of the Platform for Innovating State Universities and Colleges for Industry 4.0 (PISI), which was created to strengthen an inclusive innovation ecosystem and enhance collaboration.

### Innovation Initiatives

From 2014 to 2019, the Philippines recognized key opportunities and threats that offer potential for social and economic rewards related to solving issues facing the country and the world. As such, the government, companies, and academia have legislated and launched various initiatives, legislation, and events that are shaping how people are educated and enabled to work to solve problems and derive economic value through research and technology. For selected initiatives, [TABLE 2](#) illustrates ecosystem elements involved and key stakeholders. This list does not represent all initiatives, but it does include those mentioned during interviews and reflects the significant efforts by government, academia, and industry, including the venture community.

11. At The Manila Conference 2017, participants explored challenges in development policy and the need for government to adapt to the changes brought on by innovation, as represented by Dr. Marian Panganiban, Sr Policy Economist, Grab Southeast Asia, "Technology is going at a very fast pace but the policy environment has not been keeping up." Also, during the seminar on Measuring and Examining Innovation in Philippine Business and Industry held at PIDS, Jose Ramon Albert, PIDS Sr Research Fellow, discussed challenges hampering innovation growth in the country and the need for intentional collaboration. "The government needs to provide more leadership in bringing people and institutions together, and it is important to have one voice over the cacophony of discordant voices we may hear from various government entities." Both cited in Development Research News, Philippine Institute for Development Studies, Vol. XXXV No4 Oct-Dec 2017 ISSN 0115-9097.

12. World Bank Group. (n.d.). Philippines: Assessing the effectiveness of MSME and entrepreneurship support. Retrieved from <http://documents.worldbank.org/curated/en/853041563828559514/pdf/Philippines-Assessing-the-Effectiveness-of-MSME-and-Entrepreneurship-Support.pdf>

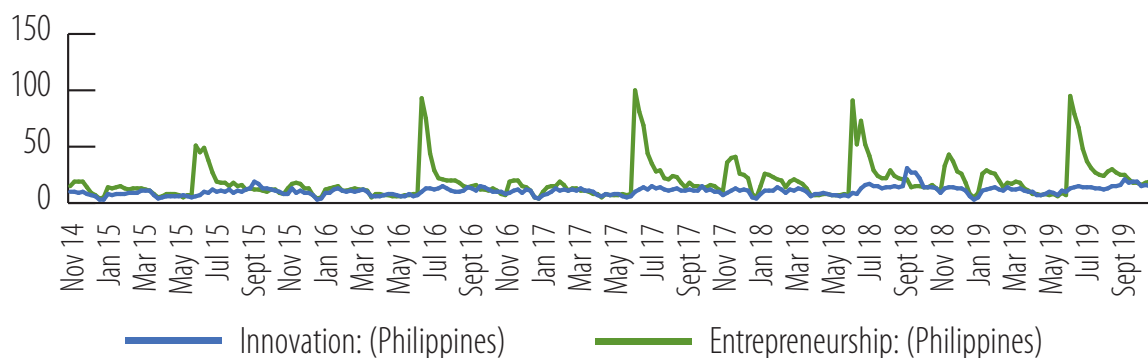
13. Sy, H. Jr. (2018). Dadao Banatao back startup to Hhlp BPOs cope with automation threat. *Entrepreneur Philippines*. Retrieved from <https://www.entrepreneur.com.ph/news-and-events/henry-sy-jr-dadao-banatao-back-startup-to-help-bpos-cope-with-automation-threat-a36-20170126>

14. Rieth, K. T. (2019). Demystifying industry 4.0: How universities can participate. Presented at the Cebu Institute of Technology, Cebu Technological University, University of San Jose Recoletos, and Batangas State University in the Philippines.

## Innovation Is A Hot Topic

Beyond the formal legislation, policies, and efforts, it is interesting to consider more popular indicators, including consumer interest in innovation via TV and the internet. Over time, there has been a slight increase in internet searches for “innovation,” as illustrated in **FIGURE 7**. The blue line indicates searches related to “innovation,” and the green line represents searches for “entrepreneurship.”<sup>15</sup> Interestingly, there is a cycle each year where the search for entrepreneurship spikes, typically occurring in the first 2 weeks of June.<sup>16</sup> TV offerings also highlight an increased interest in entrepreneurship.

▼ **FIGURE 7** There has been a slight increase in the volume of internet searches for innovation (blue) and entrepreneurship (green) in the Philippines.



Launched in 2017, *The Final Pitch*, is loosely based on the American TV shows *Shark Tank* and *The Apprentice*. *The Final Pitch* is the Philippines’ first business reality show where entrepreneurs pitch to a panel of investors. The show reflects the rise in investment and interest in entrepreneurship and startups. The growing sophistication of contestants has been notable.

John Aguilar, a serial entrepreneur, is the President and founder of StreetPark Productions Inc. Established in 2003, StreetPark is an independent television production company that produces for a local and international audience.

StreetPark Productions’ TV shows over the last 10 years have shifted from a focus on real estate and construction to intense startup competitions. These media products reflect Filipinos’ shifting views about investment, from traditional areas toward an increasing interest in more product-/service-based entrepreneurship and innovation.

“There is a greater interest now in entrepreneurship than ever before, the Filipino audience is ready for this show. Entrepreneurs are the new rock stars ... paving the way for more and more young people to dream big and work hard to achieve success through entrepreneurship. *The Final Pitch* gives the Filipino audience a chance to live their entrepreneurial dreams vicariously through our entrepreneur contestants on the show and learn from the investors and mentors that we have tapped to be part of it.”

—John Aguilar

<sup>15</sup>. [Google Trends](#)’ search comparison for “innovation” and “entrepreneurship” topics originating from the Philippines within the past 5 years [graph retrieved on October 25, 2019].

<sup>16</sup>. A quick analysis of funding cycles and events was performed as a potential basis for the uptake in searching, but no definitive cause was identified.

**TABLE 2** The Philippines has invested in initiatives, policies, and events to build a stronger innovation ecosystem.

Legislation/Initiative/Policy/Event		Innovation Ecosystem Elements					Stakeholders	
		Human Capital/Education	Knowledge Creation	Knowledge Transfer	Startups /Spinoffs	Collaboration	Government of the Philippines	Other
2012	Ideaspace Foundation (SMART Communications Inc.) and Kickstart Ventures (Globe) founded as first commercial incubator and accelerator							SMART, Globe
2013	Philippine Startup Challenge is an ongoing national student startup competition inspiring college students to create innovative technology-based solutions to pressing societal problems						DICT	Philippine Software Industry Association
2013	Enhanced Basic Education Act (RA No. 10533) adds 2 years of education for K-12						DepEd	
2013	USAID Science, Technology, Research and Innovation for Development (STRIDE) Program supports inclusive economic growth by boosting S&T research via research grants, training, fostering collaboration, strengthening S&T policy						All	USAID, Industry, and Academia
2013	The Innovative Development through Entrepreneurship Acceleration (IDEA) Program is a 3-year joint venture to cultivate entrepreneurial competency among Filipino engineering students						CHED	PhilDev, USAID, Academia
2014	The Leaders in Innovation Fellowship is a postgraduate certificate to create a network of innovators and support them in technology commercialization						DOST	Asian Institute of Mgmt. (AIM), British Council Newton Fund
2014	The National Academy of Science and Technology Strategic Plan 2014-2019 recognizes scholarly work and aims to expand linkages with National Academies in other countries						DOST	Global National Academies
2014	Technology Business Incubation (TBI) offices are established at universities to promote innovation and technopreneurship by hosting startups and provide business development services						DOST	Partner Universities
2014	Innovation and Technology Support Office (ITSO) supports the Intellectual Property Office of the Philippines (IPOPHL) in building the skills to deliver IP-related services, including preparing patent applications						IPOPHL	Partner Universities
2015	Philippine Roadmap for Digital Startups helps grow the startup community						DICT	
2015	Knowledge and Technology Transfer Office (KTTO) Program builds capacity of higher education institutions (HEIs) on how to operationalize and manage technology transfer offices; in 2019, DOST partnered with USAID STRIDE to expand the program and train local mentors						DOST	USAID STRIDE, Partner Universities
2016	University of Science and Technology of Southern Philippines (USTP) is established with a new Senate-approved charter to be a knowledge center to drive innovation towards a stronger national economy and global competitiveness..							USAID STRIDE
2016	Technical Vocational Livelihood (TVL) adds vocational training for senior high school students						DepEd	
2016	Philippine Science High School Act (RA No. 9036) amended to increase access to advanced science training in high school students outside Metro Manila						DOST	
2016	Pursuant to the Philippine Technology Transfer Act (RA No. 10055) the Fairness Opinion Board evaluates proposed licensing terms from publicly funded research, supported by fairness opinion reports for key industries						DOST	
2017	The Science for Change (S4CP) Program was developed to accelerate science, technology and innovation through increased investments on S&T human resource development. Legislation on S4CP is being considered in both houses of Congress						DOST	Partner Universities
2017	DOST's Young Innovators Program recognizes promising researchers, including high school students, to motivate them to do scientific research						DOST	
2017	Universal Access to Quality Tertiary Education Act (RA No. 10931) provides free tuition in 214 HEIs; PHP 1 billion allocated for short-term student loans						CHED	

## Legislation/Initiative/Policy/Event

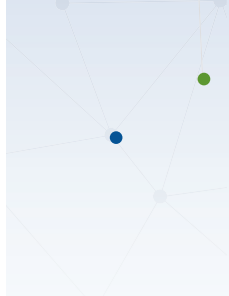
		Innovation Ecosystem Elements					Stakeholders	
		Human Capital/Education	Knowledge Creation	Knowledge Transfer	Startups /Spinoffs	Collaboration	Government of the Philippines	Other
2017	Niche Centers in the Region for R&D (NICER) Program to boost research for regional development by providing grants to build R&D capacity of HEIs in the regions						DOST	
2017	Business Innovation through S&T (BIST) for Industry Program aims to strengthen S&T innovation activities and technological capacity of private sector; provides funding for equipment procurement, patenting, and licensing						DOST	Industry
2017	Globe Telecom's Future Makers Program supports innovators in delivering technology-driven solutions to social challenges							Singtel, Optus
2017	Google Launchpad Accelerator Program awards startups USD 50,000 (equity-free) investment and mentorship for 6 months							Google
2017	Harmonized National R&D Agenda (HNRDA) 2017-2022 outlines the different priority areas for R&D						DOST	
2017	Science for Change Program (S4CP) Act (Senate Bill No. 1548) for increased budget of PHP 21 billion for R&D (from 5.8B) for 2018, to double yearly for 5 years, capped at PHP 672 billion by 2022						DOST	
2017	Collaborative R&D to Leverage Philippine Economy (CRADLE) Program introduced to the R&D innovation system by bridging academia and industry, and stimulating collaboration						DOST	Academia, Industry
2017	R&D Leadership Program (RDLead) aims to improve and accelerate the use of research results to respond to pressing social and development challenges						DOST	
2017	"Juana make a mark" Trademark Incentive Program waives IP filing fees for up to 1,000 women entrepreneurs and micro, small, and medium businesses that employ at least one woman in their teams						IPOPHL	
2017	IPOPHL launches an online filing system to support patent applications						IPOPHL	
2017	HEIRIT (Higher Education Institution Readiness for Innovation and Technopreneurship) Development delivers training for TBI operations and improves entrepreneurial culture in universities						DOST	Partner Universities
2017	The Philippine Development Plan (PDP) 2017–2022 lays out foundation strategies for inclusive growth with the goal to transform the Philippines into a knowledge economy driven by innovation						NEDA	
2017	IGNITE showcases innovation and technologies from local Philippines startups distinguished international investors and influencers							TechShake, DM Lab, Dentsu, IGPI
2017	The Inclusive Innovation Industrial Strategy (i3s) aims to grow and develop globally competitive and innovative industries by focusing on pillars supporting new industries, clusters, and agglomeration						DTI	
2018	Inaugural TBI Summit to support a Community of Practice						DOST	Partner Universities
2018	Balik Scientist Law (RA No. 11035) provides benefits and incentives to encourage overseas Filipino researchers to practice in the country						DOST	
2018	DTI joins Startup Genome Project that authors the Global Startup Ecosystem Report (GSER), which features strategic startup ecosystems globally						DTI	Global Organizations
2018	President Duterte signed RA 11032 establishing Ease of Doing Business Law to reduce turnaround time for filing and grants						DTI	
2018	Senate Approves Senate Bill No. 1532: Innovative Startup Act to provide entrepreneurs tax breaks and other forms of assistance to improve the likelihood of success						PH Senate	

## Legislation/Initiative/Policy/Event

### Innovation Ecosystem Elements

### Stakeholders

		Human Capital/Education	Knowledge Creation	Knowledge Transfer	Startups /Spinoffs	Collaboration	Government of the Philippines	Other
2018	Filipinnovation Entrepreneurship Corps enables researchers to assess commercial and societal value via experiential learning to improve commercialization outcomes						DOST	Partner Universities, USAID STRIDE
2018	Memorandum of understanding (MOU) on Startup Assistance Program 2019-2023 signed for a 5-year roadmap that will develop strategies and provide assistance to 1,000 startups						DICT, DOST, DTI	
2018	The Philippine Inclusive Filipinnovation and Entrepreneurship Roadmap outlines innovation strategies, policies, and milestones						DTI	
2018	Opening of IPOPHL Satellite Offices in Zamboanga (Region 9), Dumaguete (Region 7), and Naga (Region 5)						IPOPHIL	
2019	President Duterte signed the Philippine Innovation Act (RA No. 11293) to improve the innovation ecosystem						All	
2019	President Duterte signed RA No. 11337 creating the Philippine Startup Development Program offering benefits and incentives to both startups and enablers						DOST, DICT, DTI	
2019	The Competitiveness and Innovation Group (CIG) was created to support the country's agenda to increase competitiveness and ease of doing business. CIG is led by Undersecretary Rafaelita M. Aldaba						DTI	
2019	The Platform for Innovating State Universities and Colleges for Industry 4.0 (PISI) was created to strengthen an inclusive innovation ecosystem and enhance collaboration							PASUC, STRIDE, PhilDev, Singapore Polytechnic
2019	President Duterte signed RA No. 11230 establishing a Philippine Labor Force Competencies Competitiveness Program and Free Access to Technical-Vocational Education and Training (TVET) also known as the Tulong Trabaho Act						Tulong-Trabaho Fund	
2019	Entrepreneurship Education Committee signs Implementing Rules and Regulations (IRRs) for the Youth Entrepreneurship Act (RA No. 10679) establishing entrepreneurship classes for K-12 students						DepEd, CHED, TESDA, DTI	
2019	Science Education Institute (SEI) Scholarship Program (RA No. 7687 and 2067) at all-time high with 9,852 graduating high school students qualifying for undergraduate science scholarships						DOST, DepEd, CHED, TESDA, DTI	
2019	Ayala Corp. launches a new venture capital fund worth USD150 million focused on startups in key industries						DOST	Ayala Corp., Public Universities
2019	MSME Finance Institute helps secure venture capital for startups via consultancy workshop services for lending institutions						DTI (SB Corp.)	UP Los Baños
2019	The Securities and Exchange Commission (SEC) approved the registration of the first one-person corporation organized under RA No. 11232, or the Revised Corporation Code of the Philippines						SEC	
2019	The Philippine Space Agency (PhilSA) is created by RA No. 11363, also known as the Philippine Space Act, to invest in R&D						DOST	
2019	Universal Health Care Act (RA No. 11223) and IRR includes provisions on health technology assessment, health information systems, and evidence-informed sectoral policy and planning						DOH	
2019	Regional Inclusive Innovation Center (RIICs) pilots in four regions bringing together regional stakeholders to further drive the innovation ecosystem through collaborations						NEDA, DTI	



“The government is now very warm and open to hear criticism from us, unlike in the past when we could not say anything. They are now more open and willing to sit down with us to plan and develop new initiatives. In fact, we collaborated with them to craft policies that are meaningful to the community.”

–Academia

“In the Philippines we tend to rely on what is going on outside of the country; we wait to see what others are doing before we act. We are two steps behind.”

–Industry

“There is still too much red tape resulting in delays in procurement; on many occasions researchers had to shell out their own money in order to speed up the process. Reimbursements can also take a long time.”

–Government

“I just hired a mechanical engineer for an administrative position. All of her computer skills (PowerPoint, Excel, etc.) were based on theory [without practical experience].”

–Industry

“Industry has started to recognize that it has a lot to gain by partnering with academia. Academia has started to realize that it must align curricula with the needs of industry.”

–Academia

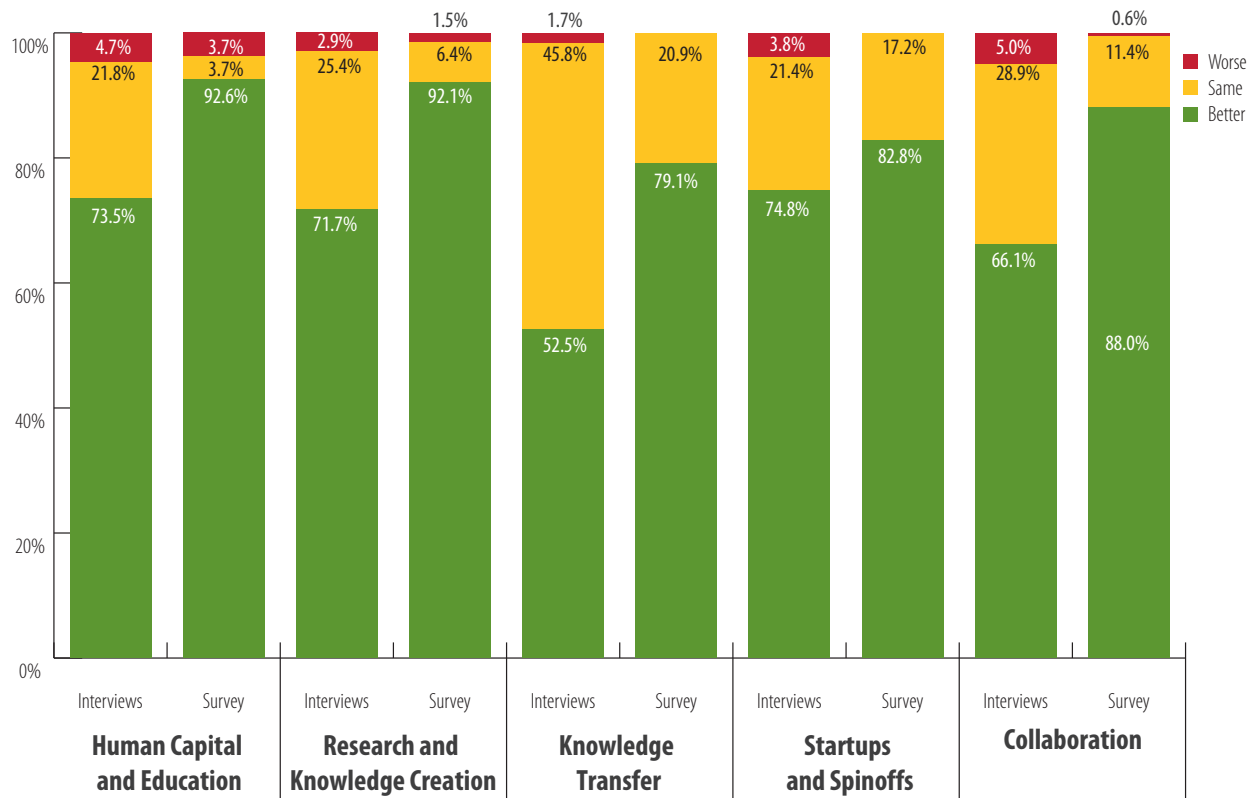
“The academic community is becoming aware of innovation programs, especially through the support provided by the government. However, more work is needed If we want to improve our innovation capacity.”

–Academia

## CHAPTER 3: FINDINGS

**Overall**, primary research revealed a positive perspective on the improvement in the innovation ecosystem since 2014. Over 68 percent of the responses indicated a perception of an improved or strengthened innovation ecosystem. Approximately 28 percent of the respondents perceived that factors underlying the ecosystem had remained the same, and less than 4 percent of responses indicated that the innovation ecosystem had worsened. Across both the interviews and survey responses, the feedback collected on changes in the innovation ecosystem across all elements was favorable (see [FIGURE 8](#)).

FIGURE 8 Stakeholders indicated improvement across all innovation ecosystem elements, with survey participants noting more positive change.



Priorities and perspectives varied, but human capital and education were the highest priority for innovation across all stakeholder segments (startups, academia, industry, government, and nonprofits), and most responses registered improvement in this area. Conversely, all stakeholder groups ranked startups and spinoffs as the lowest priority element.

The remainder of this chapter is organized around the innovation ecosystem elements. Each section provides a definition of the element, summarizes quantitative data, and offers commentary on initiatives and impacts, including quotes directly from interviewees.



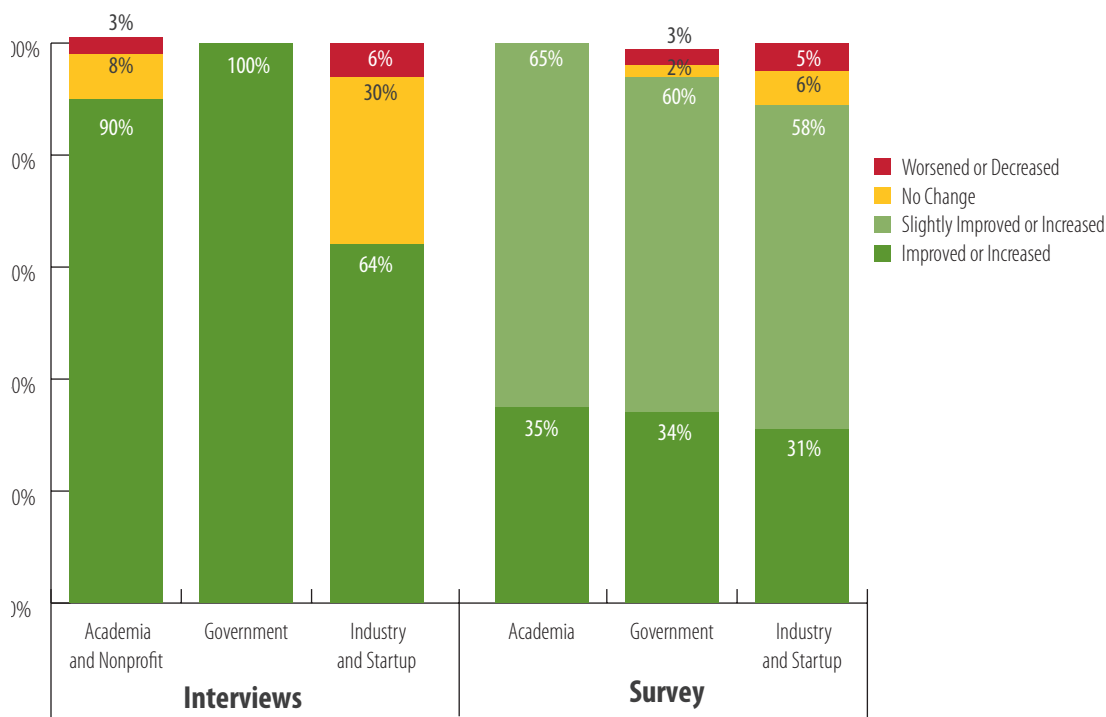
# Human Capital and Education

“When academia began integrating innovation and creativity in classrooms, there was a slight paradigm shift in terms of what students expect to face in the workplace.”

–Academia

Human capital embodies the skills, knowledge, and capabilities that can be translated into productivity as an organization’s capacity to absorb and organize knowledge and to innovate. Skilled human capital is central to a healthy and vibrant ecosystem. Healthy innovation ecosystems, at their core, need a critical mass of individuals qualified to support established and nascent high-value industries. In 2019, government stakeholders believe they are making strides in improving human capital and education. High-profile programs such as the Balik Scientist Act are attempting to bring back Filipino graduates, and academia is starting to work with industry on curriculum development. Industry agreed that the number of graduates has increased, and data suggests this is particularly true in STEM fields. Academia and industry stakeholders thought that more support and faster action from government are needed to further improve human capital. “Brain drain,” referring to STEM graduates leaving the country to seek employment elsewhere, is still a challenge. While talent has improved, academia is still not fully aligned with the needs of employers or aimed at/enabled adequately for meaningful applied research. The government and academia were more positive in their responses than the private sector (see [FIGURE 9](#)). Across all groups, respondents agreed that whatever improvements have been achieved are “slight,”<sup>17</sup> indicating that more work is needed. Comparing across elements, interviewees were more critical of human capital outcomes and collectively recognized a need for further improvement.

**FIGURE 9** Industry tends to be more critical of the improvement in human capital and education for innovation than other stakeholders.



<sup>17</sup> Interviewees were given three response options (improved, remained the same, declined/worsened), while the survey had five (greatly improved, slightly improved, remained the same, slightly declined/worsened, or greatly declined/worsened)

# PERSPECTIVES ON SUPPLY

The absolute number of graduates increased, largely in STEM fields. However, the labor force participation rate decreased, and graduates still lack key skills to meet industry needs. Stakeholders perceived the overall quality of the graduates to be unchanged. There is also an opportunity to establish more STEM-centric programs beyond the master's level, including both PhD programs and postdoctoral research programs focused on applied research. STEM-related salaries in the Philippines remain comparatively low, leading to many talented graduates leaving the country for higher compensation, which contributes to the continuous “brain drain” in the Philippines.

## Enabling Environment

“The Philippine innovation ecosystem has improved because of government support for upgrading human resources through scholarship and research grants, as well as support for research facilities in some universities.”

–Government

“The education system is still too focused on getting students to pass board exams. However, passing board exams does not mean students will meet the actual needs of industry.”

–Industry

This research indicated improvements in the enabling environment (e.g., systems, policies, collaboration initiatives) that support human capital and education related to innovation. There is general agreement that academia is now more proactively seeking industry input on curricula, and data indicate that universities are producing more STEM graduates. All stakeholders applauded the improved connection and alignment between DTI, DOST, and DICT, as evidenced by a recent MOU signed by the agencies. Legislation aimed at improving human capital and education has been enacted (i.e., The Basic Education Act and The Quality Tertiary Act and the Tulong-Trabaho Fund), further supporting the growth of the ecosystem. A significant number of Filipino students now have the opportunity to study abroad.

Nearly all government stakeholders who participated in this research perceived that the actions taken helped improve human capital in the innovation ecosystem. Unfortunately, this view was not shared as strongly by nongovernment stakeholders. While the majority agreed the area of human capital and education has improved slightly, some academic and industry stakeholders expressed frustration at the slow pace of change. Government regulations on curriculum development are still a major barrier to aligning curricula with industry needs. Stakeholders articulated that the Department of Education (DepEd) and CHED have been slow to correct misalignment and are less likely to seek or accept industry input, less connected with other government agencies, and less supportive of university–industry connections. CHED is aware of these challenges and is taking steps to address them, as seen through collaboration with the Board of Investments (under DTI) and the Japan International Cooperation Agency (JICA) in improving the curriculum for the automotive industry. CHED plans to ensure technical panels include industry representatives. The agency is struggling with a large backlog of about 400 pending applications on curriculum changes.

# PERSPECTIVES ON DEMAND

Industry's perception is that universities now come to companies for help in thinking about the skills graduates need, but education in general is still too focused on preparing students for licensing exams that do not match real skills needed in industry. There has been some improvement toward a culture of innovation, but academia is still perceived to be more focused on academic publications than on applied research. Stakeholders in academia perceived an increase in industry collaboration on curriculum development and R&D, but this outcome may be the direct result of academia intentionally connecting to industry.

Furthermore, policies that impede hiring foreign faculty reduce diversity and limit the Philippines' ability to leverage rapid global advances in education related to technology and drivers of innovation. Academia and government agencies do not believe they can address this issue because it is an enacted law in the country. Further challenges in diversity come from Filipino students who study abroad. Although they are exposed to emerging technologies and entrepreneurship, many graduates choose not to return to Philippines.

The Universal Access to Quality Tertiary Education Act, one of the most notable recent policy initiatives, is causing smaller private universities to struggle to attract students who are choosing lower-cost public universities. Stakeholders also cited responses to the policy that have negative impacts on the quality of graduates from state universities and colleges: increasing the student-to-faculty ratios and increasing acceptance rates (as a strategy to capture subsidies).

"Current CHED regulations prevent [HEIs] from rolling out new curricula to address new skills that are needed [by industry]. The current curriculum is outdated and does not teach students about new technologies."

–Industry

## Initiatives of Note

- Stakeholders expressed optimism and saw some impact from government efforts over the last 5 years to grow human capital and education through legislation, including The Basic Education Act and The Quality Tertiary Act.
- Recent reforms in education have focused on boosting enrollment levels, leading to an increased number of graduates and slight improvement in the quality of higher education. In 2018, the Philippines government, through CHED, allocated PHP 40 billion to finance the education of over 250,000 students who either received subsidies or free education in technical-vocational education and training.<sup>18</sup>
- In February 2019, President Duterte signed the Tulong-Trabaho Fund, which will establish a Philippine Labor Force Competitiveness Program and free access to technical-vocational education and training for Filipinos who pass qualification standards. It will fund the education of qualified beneficiaries in training programs that will be certified by TESDA.<sup>19</sup>

18. Sino Cruz, I. (2019, July). Education among priority areas of the Duterte administration-Bautista. *Cebu Daily News*. Retrieved from <https://cebudailynews.inquirer.net/244149/education-among-priority-areas-of-the-duterte-administration-bautista>

19. Ranada, P. (2019, March). New law gives qualified Filipinos free access to technical-vocational education. *Rappler*. Retrieved from <https://www.rappler.com/nation/225644-new-law-gives-qualified-filipinos-free-access-technical-vocational-education>



# IMPACT METRICS

- In 2018, the Philippines dropped 10 places to rank 55th out of 63 countries in the IMD World Talent Ranking, supporting interviewees' perceived lack of improvement in talent quality. The lower rank can be attributed to the mismatch often cited between school curricula and industry demands.<sup>20</sup> The percentage of higher education faculty with MAs/MSs and PhDs increased slightly (less than 1 percent) from 2017; pass rates for faculty licensure examination dropped from 37.55 percent to 36.82 percent across all disciplines. The most significant drop was in the passing rate in the sciences; only 43.01 percent passed in 2018, down from 53.04 percent in the prior period.
- Although the increase in graduates across all fields in the Philippines, was only 0.73 percent year over year in 2018, the number of STEM graduates increased by 7.64 percent.<sup>21</sup> Reforms to the Enhanced Basic Education Act have been enacted, but many stakeholders cited the decrease in National Achievement Test scores, continued industry skills mismatch, and unemployability as grounds to re-evaluate or even repeal the law.<sup>22</sup>
- In the 2019 Global Talent Competitive Index, the Philippines placed in the bottom 10 percent in retaining talent. With hallmark reforms and initiatives on education recently passed (such as the Universal Access to Quality Tertiary Education Act and Tulong-Trabaho Fund), further improvements in human capital and education development can be anticipated.<sup>23</sup>
- An early indication of internationalization was observed from the increase in Filipino students studying abroad: 16,578 (2018) versus 8,413 (2008).<sup>24</sup> Global perspectives help bring new ways of thinking about challenges and solutions to the Philippines.



"There's a mismatch between what universities are producing and what students need to learn--and are learning on their own because they know they need to."

—Industry

**In summary**, education and the resulting human capital improved, albeit slowly. Stakeholders pointed to many opportunities for further strengthening. Government stakeholders held a stronger view of recent improvements than other stakeholders, though the category was a top priority for all. The quantity of talent has increased, and academia is starting to work more closely with industry on curriculum development and some sponsored research. Applied research is still a gap in the ecosystem, and the quality of talent needs further improvement to meet industry's needs. The government has successfully passed legislation aimed at addressing these challenges, but the actual impact on the higher education ecosystem will need to be monitored to ensure effectiveness.

20. Khidhir, S. (2018, November). Improving education in the Philippines. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/improving-education-philippine>

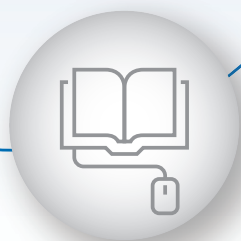
21. Commission on Higher Education (CHED). (2018). Higher education indicators 2018. Retrieved from <https://ched.gov.ph/higher-education-indicators-2018/>

22. Torregoza, H. (2019, July 23). Senator Gatchalian wants to review the implementation of k 12- program. *Manila Bulletin*. Retrieved from <https://news.mb.com.ph/2019/07/23/senator-gatchalian-wants-to-review-the-implementation-of-k-12-program/>

23. Republic of the Philippines, Commission on Higher Education. (2018, August 14). CHED Chief: Reports on budget cut for Free Higher Education misleading. Retrieved from <https://ched.gov.ph/blog/2018/08/14/ched-chief-reports-on-budget-cut-for-free-higher-education-misleading/>

24. Saavedra, J. R. (2019, March 22). Filipinos studying abroad almost double in 9 years: CHED exec. Philippine News Agency. Retrieved from <https://www.pna.gov.ph/articles/1065206>

# Research and Knowledge Creation

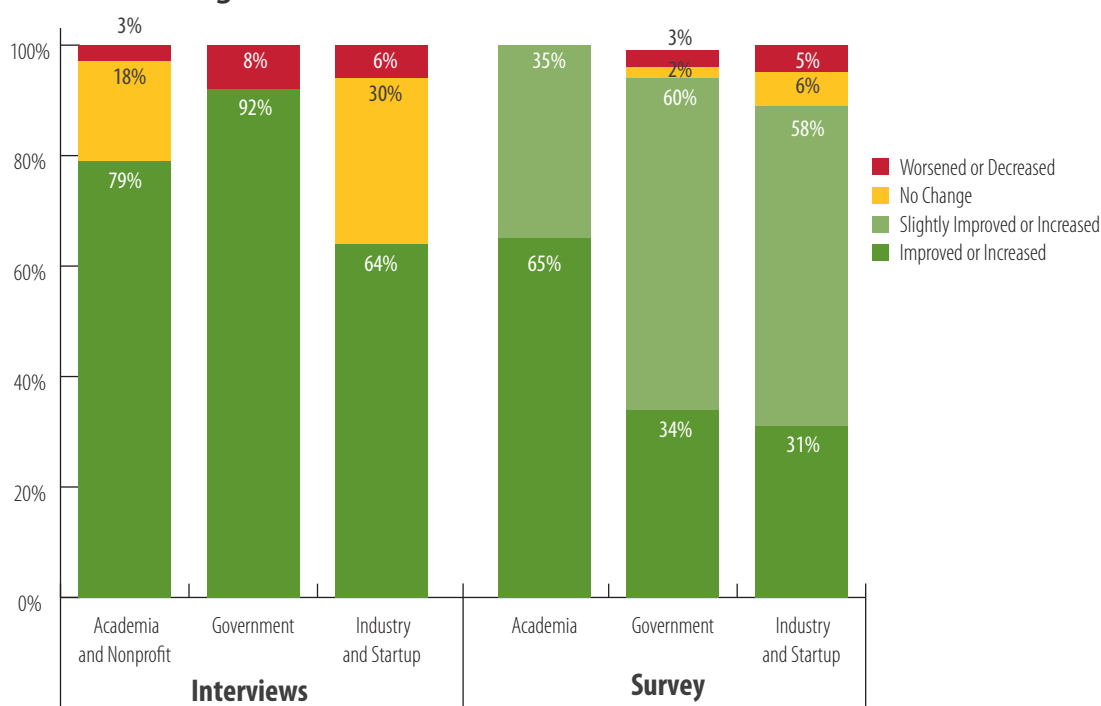


“Our R&D capabilities are better today [than they were] 5 years ago, but that’s the result of our teams being exposed to a lot of things outside of the country.”

–Academia

A healthy innovation ecosystem has human capital, enabled by education, that is creating knowledge via (1) basic research that relates to discovery and exploring or expanding the foundations of science, (2) applied research that builds on previously acquired knowledge, and (3) translational research that works to consider the cross-discipline application of previous findings. This knowledge creation is often carried out by universities, but in healthy ecosystems meaningful research is also carried out in government and private-sector labs. In 2019, government and academia believe research and knowledge creation have improved significantly, especially in terms of supply and the enabling environment. Interest in research is growing as evidenced by a wider understanding of its importance and stronger connections between industry and academia. Government-funded programs/facilities are expanding, especially outside of NCR. The impact of these improvements, however, needs more time to become evident. Industry-funded research or licensing from universities remains rare. Nearly all government respondents pointed to improvement in research, while some from academia and industry registered no change. (See FIGURE 10) When compared with other ecosystem elements, research and knowledge creation had the greatest number of “worsened” responses among government interviewees. In survey responses, government and industry agreed improvements in research and knowledge creation were limited, while academia responded more favorably.

FIGURE 10 Government is less positive about improvements in research and knowledge creation.



# PERSPECTIVES ON SUPPLY

R&D funding from the government and the number of research grantees have increased slightly. However, the Philippines is still well below global guidelines for percentage of GDP spent on R&D.<sup>25</sup> Patent filing activity has held steady since 2014 and continues to lag behind peer countries like Indonesia and Malaysia. Researchers continue to lack access to the latest technologies and, in some cases, even to databases of global scientific publications. This reality highlights the frequently cited concern that researchers in the Philippines are neither aware of nor are they building on research conducted outside their own labs.

## Enabling Environment

“Before, R&D funding was focused on the NCR Region. Now, government is trying to develop regional capacity.”

–Government

“Research is never highlighted, to children, as a good career pathway. This is a cultural thing, and something we’d like to change for the future.”

–Academia

“There have been no additional funds for R&D in the last 2 years. The 3 prior years were good, but now, as a percent of GDP, we’re not moving as we need to move.”

–Government

The enabling environment for R&D is improving, albeit slowly. Some universities are beginning to prioritize R&D and enabling faculty to shift teaching time to research activities. Academia also believes researchers are slowly moving from a publication-focused culture to a more innovative culture focused on driving real impact. Industry also recognized this trend and noted some improvement in industry–academia collaboration. R&D activity is also expanding beyond NCR and Cebu and reaching other provinces, reducing a barrier that was noted in 2014.

Although stakeholders acknowledged slight improvements, many challenges need to be addressed to drive research and knowledge creation forward. Innovation occurs at the bleeding edge of market needs and is often driven by new technologies. Researchers’ lack of awareness about needs, enabling technologies, and competing solutions is a barrier to innovation. In general, the current environment for research and knowledge creation still largely matches the environment in the 2014 Philippines Innovation Ecosystem Assessment. Most professors are still expected to conduct research on top of the same full teaching workload, while complex procurement and administrative burdens create additional barriers. Little support is available to professors for these activities, leaving less time for impactful scientific discovery. Industry stakeholders had little awareness of the research capabilities of universities and still hold the belief that most university researchers work at a pace that is misaligned with industry’s needs. Academic stakeholders believe changes to the incentive structure are an opportunity area that can help encourage further adoption of an innovation-focused culture.

25. United Nations Educational, Scientific and Cultural Organization (UNESCO). (2013). *Data for the sustainable development goals*. Retrieved from <http://uis.unesco.org>

# PERSPECTIVES ON DEMAND

Industry's appetite for R&D in the Philippines is improving, and government is making more research funds available for industry-led R&D activities. However, organizations are hesitant to access these funds because of the bureaucratic application and project management processes. Risks associated with changing politics and auditing were also frequently noted as factors reducing industry's demand for collaborative research. Large organizations, including multinational corporations, typically perform their R&D activities outside the Philippines. Industry still hesitates to work with Filipino universities, citing lack of speed, talent, and access to the latest technologies.

## Initiatives of Note

- In 2016, the Philippines Senate approved the charter to establish the University of Science and Technology of Southern Philippines (USTP).<sup>26</sup> The new charter set the role of the university as a knowledge center that provides technology innovation and solutions leading towards a stronger national economy and international competitiveness. USAID STRIDE was a strong supporter and influencer of the new charter, which was groundbreaking in that it allowed faculty to extend their science and technology extension work by making it easier for faculty to reduce teaching loads to focus on research.
- The United Nations Educational, Scientific and Cultural Organization (UNESCO) recommends a benchmark of 380 researchers and scientists within a country per one million population. The Philippines falls short with a low 189 researchers per million.<sup>27,28</sup> To address this, the government proposed the Science for Change Program (S4CP) bill in 2017, which aimed to institutionalize the use of PHP 21 billion for R&D in 2018. The commitment was expected to double the amount of funds every year until the total budget reached the cap of PHP 672 billion by 2022.<sup>29</sup> In this program there were several projects facilitated primarily by DOST aimed at improving the quality of research, giving access to facilities and equipment, and enhancing collaboration between the public and private sectors, including academia.
- In 2018, the legislature also enacted the Balik Scientist Law to help reverse the effects of "brain drain." The law aims to attract overseas Filipino researchers with financial benefits and incentives to help close the development gaps in the Philippines. The benefits also include special working and nonworking visas, round-trip airfare from a foreign country to the Philippines, exemption from the local travel tax, and DOST-subsidized visa application. Long-term Balik Scientist awardees can enjoy relocation benefits, such as support in securing job opportunities for the spouse of the awardee and admission support for the children of awardees in preferred schools; a relocation allowance and a monthly housing or accommodation allowance; and funding for the establishment and development of a facility or laboratory.<sup>30</sup>

"Procurement is still antiquated, tedious, and bureaucratic. The number of requirements for bidding is huge. You have to countersign every page, and the documents do not get read. Sometimes, [the process] is successful, but [success] depends on the bid and awards committees and policies."

—Industry

"The increase in grants helps, but we need more enabling policies, in terms of providing time for faculty to do research. We don't provide enough time, and [we have] processes that hinder research."

—Industry



26. University of Science and Technology of Southern Philippines. (2019) University Charter. Retrieved from <https://claveria.ustp.edu.ph/college-charter/>

27. World Bank. (2017). Researchers in R&D (per million people). UNESCO Institute for Statistics. Retrieved from <https://data.worldbank.org/indicator/SP.POPSCIE.RD.P6>

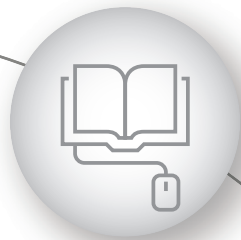
28. UNESCO. (2019). Philippines: Science, technology, and innovation. Retrieved from <http://uis.unesco.org/en/country/ph?theme=science-technology-and-innovation>

29. Senate Bill No. 1548: Science For Change Program (SCP) Act of 2017. Retrieved from [https://www.senate.gov.ph/lis/bill\\_res.aspx?congress=17&q=SBN-1548](https://www.senate.gov.ph/lis/bill_res.aspx?congress=17&q=SBN-1548)

30. S&T Media Service. (2018, June). President Duterte signs Balik Scientist Law. DOST. Retrieved from <http://www.dost.gov.ph/knowledge-resources/news/49-2018/1414-president-duterte-signs-balik-scientist-law.html>

# IMPACT METRICS

- Government stakeholders acknowledged a small increase in R&D expenditure over the past 5 years as an improvement, but not to the level necessary to drive significant changes in the innovation ecosystem. DOST planned to address this gap with the S4CP, but their goal of doubling the amount each year until the total budget reaches the cap of PHP 672 billion by 2022 is already being questioned. The allocation for DOST fell for the 2019 and 2020 budget cycles. The 2019 allocation was PHP 20.26 billion, while the 2020 allocation was PHP 20.1 billion.<sup>31,32</sup> The quality of proposals has continued to improve; however, not all programs under SC4P have had uptake with real impact. Although the amount of funding has not increased, DOST reported it has been successful in increasing the number of organizations receiving funds across the Philippines.
- By the end of 2019, DOST reported they met the target number of Balik Scientists for the year. DOST earlier projected at least 60 Balik Scientists per year. Because the agency exceeded its target, it is expected to source additional funds within the DOST budget for the program in the upcoming year. The upward trend can be attributed to the streamlining of procedures and improvements in the benefits of Balik Scientists.
- Between 2013 and 2018, STRIDE awarded a total of 65 grants amounting to PHP 259,354,400 to universities. These grants created partnerships among academia, industry, and various collaborators through STRIDE's four grant mechanisms: (1) Philippine-U.S. Research and Exchange (PURE), (2) Collaborative Applied Research with Industry (CARWIN), (3) STRIDE Prototype Research Innovation Grants (SPRIG), and (4) STRIDE Innovation for Development (SID). Of the 65 awarded grants, there were 12 PURE, 40 CARWIN, 10 SPRIG, and 3 SID grants.



"There is a slight improvement in the country's ecosystem; however, such improvement is still impeded by a lack of reform of national laws and policies [to produce] an efficient system--particularly on procurement and budgeting systems."

–Government

**In summary**, research is improving in terms of interest, understanding, and some connection between industry and academia. Government-funded programs and facilities are improving and are now reaching into the provinces. Impacts of these improvements are still nascent, however, with limited industry-funded research being conducted. Although both government and academia stakeholders perceived a significant improvement in research and knowledge creation, industry was less positive.

31. Khidhir, S. (2018, November). Improving education in the Philippines. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/improving-education-philippines>

32. Cruz, R. G. (2019, September). DOST gets lower budget for 2020. ABS-CBN News. Retrieved from <https://news.abs-cbn.com/news/09/02/19/dost-gets-lower-budget-for-2020>

# Knowledge Transfer

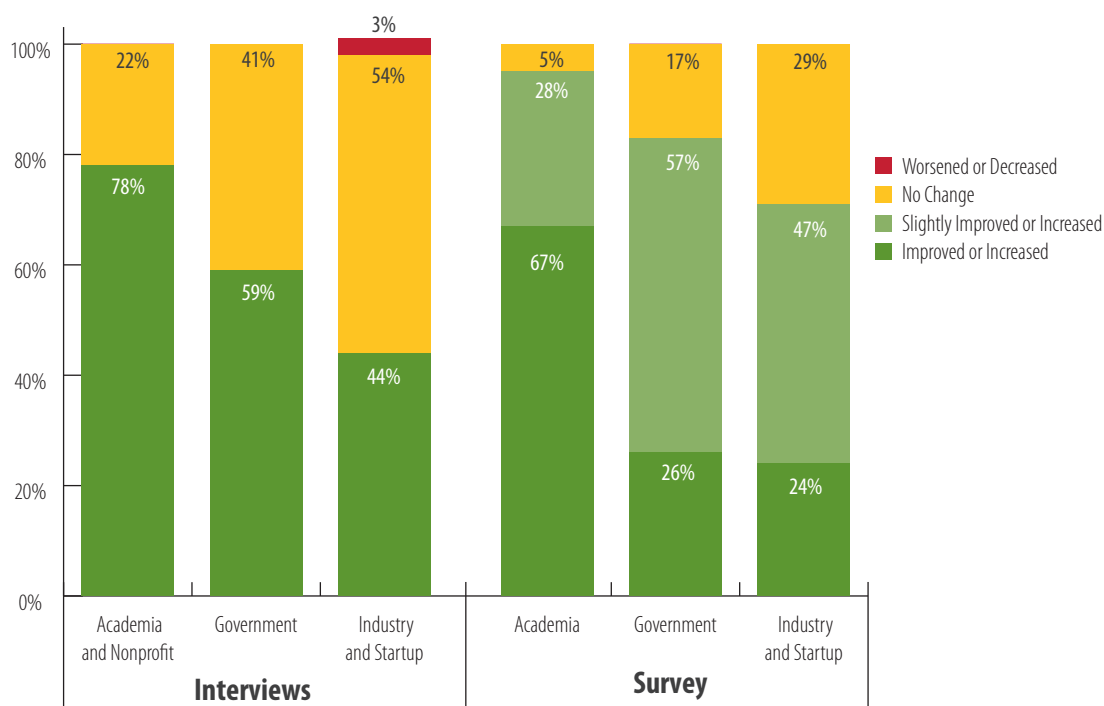


“Completed R&D [projects] are beginning to get transferred to intended users, and government R&D budgets continue to increase.”

—Government

Once knowledge has been created, it needs to be put into practice for social or economic benefit. There are three main pathways for transfer: (1) university–industry interactions, (2) licensing and commercialization, and (3) startups and spinoffs. The goal of knowledge transfer is to convert R&D into commercially valuable new products, processes, and services. Success often occurs with graduating talent that carries the tacit knowledge into industry. Also, research efforts (e.g., university or government lab) that are well aligned to a need are more likely to create market demand. Similarly, university-provided scientific or technical support directly with industry is parallel to being “peer-reviewed” or is effectively an “extension services.”<sup>33</sup> Between 2014 and 2019, knowledge transfer improved, especially in terms of supply. Many universities are connecting to industry to emphasize valuable research areas and to protect and leverage IP. Academia and government are optimistic that knowledge transfer will continue improving, especially given the recent push from government to establish more IP and KTTs around the country. Increased awareness of IP as a tool for knowledge transfer is still needed, and metrics in patenting and licensing remain low. As shown in **FIGURE 11**, knowledge transfer had the most responses of no change. Although few evaluated it as having worsened, it had among the lowest percentage of positive responses, particularly from industry. Academia was the most positive of all groups.

FIGURE 11 Few stakeholders believed knowledge transfer was worse in 2019 when compared with 2014.



<sup>33</sup> Interviewees described extension-type services being supported by some KTTs and that these nascent initiatives to provide structure in technology transfer mechanisms are favorable toward the creation of technology transfer/knowledge and technology transfer offices. However, there is still no systematic process for extension services.

# PERSPECTIVES ON SUPPLY

Stakeholders expressed that compared with 2014 there is now a stronger awareness of, and push from, government for IP protection and commercialization. Universities are responding by creating or enhancing offices to file patents, conduct outreach, and interact with industry. But more progress is still needed. Many university efforts are still nascent, and staff are building up their capability to effectively market capabilities and patent portfolios.

## Enabling Environment

“An unstable environment is a challenge. Commitments are not always forthcoming, [especially] with changes in administration or personnel. We’re investing without [seeing] future benefit.”

–Industry

“Demand starts from awareness. Industry, many times, is not engaging with universities because [industry is] not aware that [universities] have the capabilities to help solve [industry’s] problems.”

–Academia

Compared with 2014, more universities now have dedicated offices for knowledge transfer and collaboration. The establishment of ITSOs, Technology Licensing Offices (TLOs), TBIs, KTTOs, and new IP policies has improved the quantity and quality of knowledge transfer. Government has supported these offices through programs such as the Higher Education Institution Readiness for Innovation and Technopreneurship (HEIRIT) from DOST. Beyond HEIRIT, other funding programs focus specifically on commercializing research.

Although these offices and programs are now available, stakeholders reported that more should be done to encourage use of the services and opportunities they provide. Awareness of IP has grown, but it is still not fully understood as a knowledge transfer tool, and there is little pressure to protect, license, or litigate new technology. The number of attorneys with IP-centric expertise is still limited, presenting a barrier to progress.

Overall, knowledge transfer improved between 2014 and 2019. Many universities are now connecting with industry with respect to valuable research areas and to protect and leverage IP. More needs to be done to increase patenting and licensing, but both academia and government were optimistic that knowledge transfer will continue to improve, especially given the recent push from government to establish more IP and KTTOs.

# PERSPECTIVES ON DEMAND

Industry is now more open to collaborate with academia. Most collaborations today are the result of personal relationships; for example, a faculty member secures a consulting engagement with someone in industry they meet or already know. Transfer of R&D remains less common. Industry still sees limited value in R&D from Filipino universities, reporting it is seldom aligned with their needs. Some industry stakeholders who undertake research are looking outside of the Philippines for HEI partners that offer faster, cheaper, more relevant services and technologies.

## Initiatives of Note

- Many stakeholders attributed the improvements in knowledge transfer to the Technology Transfer Act of 2009, which provides a framework for governmental support of knowledge transfer. Under the Act, the government established FOBs to facilitate evaluation of licensing agreements. Stakeholders had mixed perceptions of the FOBs: some see them as an added step that negatively affects the process, while others welcome the external input. The government, including DOST, is aware of challenges related to FOBs and is working to improve them.
- In December 2019, after completion of the research phase of this study, IPOPHL launched the country's National Intellectual Property Strategy.<sup>34</sup> This strategy is meant to align IPOPHL's goal of promoting and protecting all forms of IP with the Philippine Innovation Act (PIA), which mandates that government agencies promote the diffusion of knowledge and information to promote national development.<sup>35</sup>
- The PIA will also establish a National Innovation Council (NIC) to administer an Innovation Fund: PHP 1 billion worth of innovation grants to qualified entrepreneurs and businesses. NIC is also expected to develop and launch programs to support the creation and growth of micro, small, and medium enterprises (MSMEs); provide strategic advice on research and innovation policy; develop a strategic vision for innovation; and drive growth in the innovation ecosystem. IPOPHL will be required to report to the NIC on the reforms it has introduced for (1) streamlining and rationalizing administration and registration procedures and (2) providing programs to help MSMEs register patents, trademarks, copyrights, industrial designs, and geographical indications within 6 months of the law being made effective and every year thereafter.<sup>36</sup>
- Prior to the PIA, IPOPHL, in 2016, launched an online filing system called eTMfile. IPOPHL eTMfile is a system developed in collaboration with the ECAP III Project that allows online filing of new trademarks and patents with three different payment channels. IPOPHL eTMfile also enables the submission of documents, such as the special power of attorney, request for priority examination, and declaration of actual use.

34. Republic of the Philippines, Intellectual Property Office of the Philippines. (n.d.). National intellectual property strategy. Retrieved from <https://www.ipophil.gov.ph/national-intellectual-property-strategy-nips/>

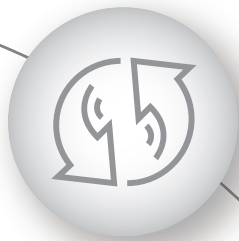
35. Republic of the Philippines, Congress of the Philippines. (2018). Republic Act No. 112931. Retrieved from <https://www.officialgazette.gov.ph/downloads/2019/04apr/20190417-RA-11293-RRD.pdf>

36. Ilas-PangNIBn, D. P., & Mitra-Ventanilla, R. (2019, August). New Philippine IP-related laws for MSMEs and startups. Baker McKenzie. Retrieved from <https://www.bakermckenzie.com/en/insight/publications/2019/08/new-philippine-ip-related-laws>



# IMPACT METRICS

- In 2018, the patent filings by Philippine residents reached an all-time high of 469, a 65 percent increase from the prior year's record.<sup>37</sup> The increase in utility model (UM) applications has been attributed to the establishment of ITSOs because over half of UM applications in 2017 came from those offices. IPOPHL has been more aggressive in disseminating information about the patent process, but many still consider the government's encouragement more as an "end vs. means" strategy because patents remain a prestige item rather than a tool for transferring IP. There are now 14 IPOPHL satellite offices across the Philippines.
- Despite the increase in patents, the amount of counterfeit goods entering the country continues to rise. In 2016, the estimated value of counterfeit goods that entered the country was PHP 6.52 billion, a 300 percent increase from the prior year.<sup>38</sup> Moreover, the value of such illegal confiscated goods further increased at PHP 8.2 billion in 2017 and continued to rise even higher to PHP 23.6 billion in 2018.<sup>39</sup> The National Committee on IP Rights has taken stricter and proactive enforcement measures, but the fight against counterfeit goods remains the Philippines' biggest challenge on IP rights.
- To bridge the gap and address concerns between academia and industry, USAID STRIDE set up the KTTO program to help HEIs establish offices to liaise between research groups in the institution and industry partners. The program was launched in 2015 and as of 2018 had trained participants from over 30 HEIs. With the demonstrated early success of the program, DOST partnered with USAID STRIDE and launched two new cohorts of KTTO training in 2019 to train 32 HEIs and 11 R&D institutions. This new collaborative effort also includes a train-the-trainer program with 10 high-performing HEIs from across the Philippines to expand the pool of mentors/trainers in the country.
- DOST has increased focus on the commercialization of its funded projects, with several new programs being established, including the Filipinnovation Entrepreneurship Corps (FEC)<sup>40</sup> and Technology Innovation for Commercialization. Furthermore, the Leaders in Fellowship program, which was established in 2014 and targets DOST-funded researchers, had provided postgraduate commercialization training for 59 fellows as of 2019.



**In summary**, knowledge transfer improved slightly, mostly in the supply area. Many universities are now proactively reaching out to connect to industry with respect to valuable research areas and to protect and leverage IP. Both academia and industry were optimistic that knowledge transfer will continue to improve, especially given the recent push from government to establish more IP and KTTOs. There are still areas related to patenting and licensing that require more focused efforts to improve.

"Knowledge transfer has significantly improved. Many universities now have TLOs, technology business incubators, and new IP policies. DOST-TAPI-assisted IP protection rose exponentially, and there are startups and spinoffs from universities and colleges."

—Government

<sup>37</sup> IPOPHL. (2019). IP statistics. Retrieved from <https://www.ipophil.gov.ph/reference/statistics/>

<sup>38</sup> Federis, M. (2018, May). Procedures and strategies for anti-counterfeiting: Philippines. Federis & Associate Law Offices. Retrieved from <https://www.worldtrademarkreview.com/anti-counterfeiting/procedures-and-strategies-anti-counterfeiting-philippines-0>

<sup>39</sup> Sadongdong, M. (2019, April 12). P65-M fake, pirated items destroyed in Camp Crame. *Manila Bulletin*. Retrieved from <https://news.mb.com.ph/2019/04/12/p65-m-fake-pirated-items-destroyed-in-camp-crame/>

<sup>40</sup> FEC is a program launched in 2018 funded by DOST, implemented in partnership with De La Salle University, George Washington University, USAID STRIDE, and RTI International.



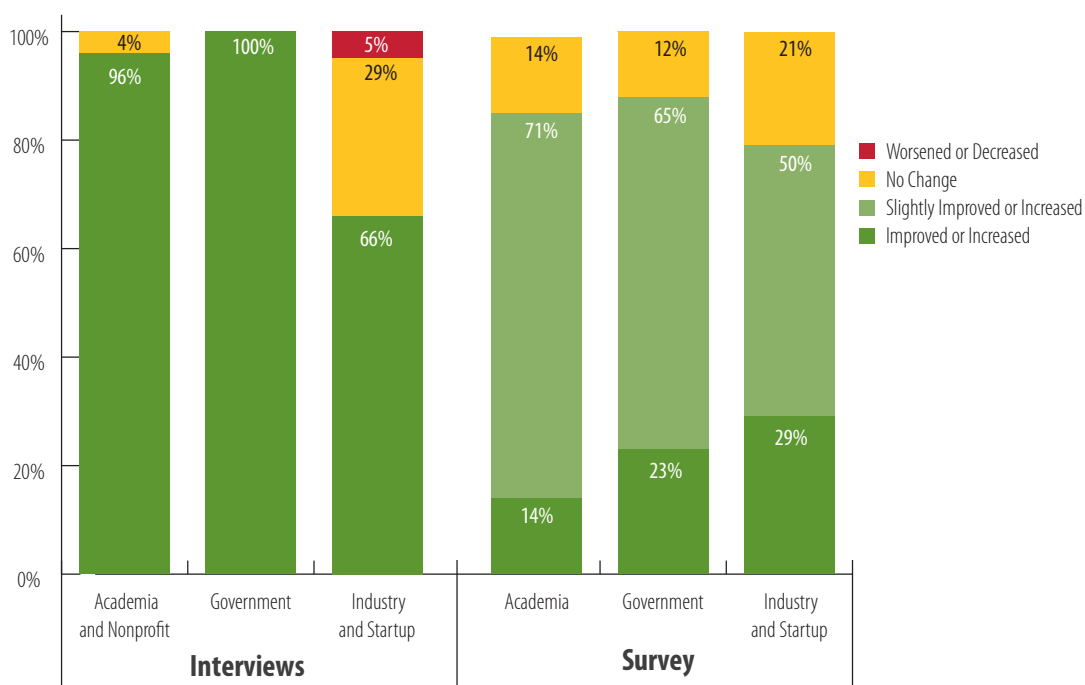
# Startup and Spinoff Companies

“On the bright side, there’s a lot more startup activity today. There’s seed money available and more people investing early from within the Philippines. But there’s a big gap at the scaling stage. Startups have to go beyond the Philippines for that.”

–Industry

Startups are new ventures aimed at a specific opportunity, often armed with a new technology or product. “Spinoff” is a term often used for a company that is grown within an organization and then splits off, such as a researcher or student starting a company with a university-created technology. Startups are usually a result of market pull, and spinoffs are more likely associated with technology push. Startups and spinoffs drive the entrepreneurial part of the ecosystem. A supporting entrepreneurial environment is crucial for growth of an innovation ecosystem because startups and spinoffs identify and enable new opportunities by moving fast. In 2019, stakeholders in all groups agree that there is increased interest in entrepreneurship across the Philippines, and a higher number of startups are being created. Although entrepreneurship is more popular now, science and technology (S&T) spinoffs are still rare. Many gaps need to be addressed for the startup scene to be globally competitive. Regulatory barriers still exist, and the ecosystem needs higher availability of risk capital. High-profile startup exits are also needed to continue to drive growth and interest, as well as a larger base of real experience to help increase interest and success via serial entrepreneurship and mentorship. Government is far more optimistic about startups/spinoffs than the other stakeholder groups, as shown in [FIGURE 12](#). This element was the least positive for startup interviewees, who were more critical or less likely to see improvements in the startup ecosystem, in which they participate.

FIGURE 12 Most respondents viewed the entrepreneurial environment as improving, though startups themselves gave the most neutral or negative responses.



# PERSPECTIVES ON SUPPLY

The research conclusively indicates that efforts in the Philippines are under way to create a healthy entrepreneurial community. As a result, the number of new startups has increased since 2014. To enable significant economic impact, however, there is a need to focus more on creating globally successful products; many new ventures are merely copies from beyond the Philippines. Greater geographic diversity is also needed (Metro Manila and Metro Cebu still dominate). Lastly, increased entrepreneurship will require a cultural shift away from traditional, risk-averse traits common in the population. Stakeholders often mentioned that parents still encourage students to work for large companies instead of starting one.

## Enabling Environment

“I think one of the biggest things the ecosystem needs is access to funding at the startup and scale-up stages, as well as programs to help SMEs move to more sustainable business models.”

–Industry

Angel investors in the Philippines are still very conservative. More funds were available in 2019 than in 2014, in particular at the seed or established stage. In addition to greater total funds available, more support organizations exist in the ecosystem today. The government is working to provide robust programs to educate and equip entrepreneurs with the tools they need not just to survive but to flourish. Stakeholders expressed optimism about newly signed laws that are aimed at lowering existing barriers.

Neither starting nor operating a business is easy for startups anywhere, let alone in the Philippines. More change is needed in the financial system, regulatory environment, and Filipino culture to enhance the entrepreneurship ecosystem. Limited access to capital, often blamed on the nascent stage of the ecosystem and low private–public sector collaboration, remains a significant hurdle for startups in the Philippines. The established financial system is not built for startups, and there is a gap in the “middle” portion of the funding landscape.<sup>41</sup> Startups still look outside of the Philippines to find investment and expertise, and many are registering businesses overseas because of the high regulatory barriers that still exist in the country.

<sup>41</sup> Stakeholders referred to the “middle gap” as investments aimed at scaling up of ventures typically in the \$5M to \$20M range.

“We need to relax the requirements so that startups can get access to funds. It is hard for them to access government funding because of registration and other rules.”

–Government

# PERSPECTIVES ON DEMAND

Compared with 2014, stakeholders noted greater awareness of entrepreneurship and more focused support in the ecosystem. Government has established technopreneurship classes across the country and supported the establishment of TBIs. Beyond government support, more corporations are supporting startup programs, including large Filipino conglomerates. However, actual collaborations between startups and large corporations are still rare, with most collaborative efforts happening between SMEs and startups. Additional support programs and legislation focused on building the startup ecosystem have been established recently, which are expected to further strengthen the startup ecosystem in coming years.

## Initiatives of Note

- The Go Negosyo Act seeks to strengthen MSMEs to create more job opportunities. The goal of the Act is to “foster national development, promote inclusive growth, and reduce poverty by encouraging the establishment of MSMEs that facilitate local job creation, production, and trade.”<sup>42</sup> DTI will be the coordinating and supervising body for all the agencies involved in establishing and operating the Negosyo Centers.
- In 2017, QBO, the Philippines’ first Innovation Hub, opened its doors. QBO was established in partnership with DTI, DOST, IdeaSpace, and J.P. Morgan.<sup>43</sup> QBO aims to serve as a linkage to innovators, investors, universities, startup mentors, and funders. The goal is to convene partnerships between the public and private sectors to support the startup community.<sup>44</sup> In December 2018, DOST, DICT, and DTI signed an MOU to work together toward having 1,000 startups by 2020.<sup>45</sup>
- The FEC program was launched in 2018 by DOST, implemented in partnership with De La Salle University, George Washington University, USAID STRIDE, and RTI International. The program provides training for researchers and students on commercialization and entrepreneurship. Twenty teams (80+ individuals) have been through the program in the first 2 years, resulting in new companies and products being launched.
- The PIA<sup>46</sup> and the Innovative Startup Act<sup>47</sup> aim to foster innovation as a vital component of national development and sustainable economic growth. These initiatives recognize that S&T are “essential for national development and progress and give priority to R&D, invention, innovation and their utilization.” The legislation removes constraints and provides incentives to encourage innovative new businesses. It will also strengthen, promote, and develop an ecosystem of businesses, government, and nongovernment institutions that fosters an entrepreneurial culture. Stakeholders expect these initiatives will lead to an improvement in the ease of doing business and bolster an innovation culture.
- In January 2019, venture capital and private equity players came together to create an investment industry association, the Venture Capital and Private Equity Association of the Philippines, that aims to foster the growth of entrepreneurship and innovation and encourage foreign investments in the Philippines.

42. Castra, A. (2015, July). Go Negosyo Act. Department of Trade and Industry (DTI). Retrieved from <https://www.dti.gov.ph/programs-projects/negosyo-center/go-negosyo-act>

43. Market Watch. (2017). QBO innovation hub officially opens doors to Philippine startups. Retrieved from <https://www.marketwatch.com/press-release/qbo-innovation-hub-officially-opens-doors-to-philippine-startups-2017-05-03>

44. Rapson, J. (2016, August). DTI, IdeaSpace launch the QBO innovation hub. Department of Trade Industry (DTI). Retrieved from <https://www.dti.gov.ph/about/updates/782-dti-ideaspace-launch-the-qbo-innovation-hub>

45. *Business Mirror*. (2018, December 23). DOST, DICT, DTI partner to boost PHL tech startups. Retrieved from <https://businessmirror.com.ph/2018/12/23/dost-dict-dti-partner-to-boost-phl-tech-start-ups/>

46. Republic of the Philippines, Congress of the Philippines. (2018). Republic Act No. 112931. Retrieved from <https://www.officialgazette.gov.ph/downloads/2019/04apr/20190417-RA-11293-RRD.pdf>

47. Republic of the Philippines, Congress of the Philippines. (2018). Republic Act No. 113371. Retrieved from <https://www.officialgazette.gov.ph/downloads/2019/04apr/20190717-RA-11337-RRD.pdf>



# IMPACT METRICS

- As a country with significant mobile and internet penetration, the Philippines has been touted as a hotbed for fast-growing tech enterprises. Over the years, the startup ecosystem in the Philippines has witnessed steady growth with the number of startups increasing to approximately 500 from over 300 since the last survey in 2017.<sup>48</sup>
- While initiatives by government agencies are encouraging more Filipinos to establish their own ventures, delays in IRRs may be hindering uptake. For example, the Youth Entrepreneurship Act, which was passed in 2015, only recently in mid-2019 had its IRR approved.<sup>49</sup>
- Manila was highlighted as one of the fastest-growing startup ecosystems by Startup Genome in its 2019 Global Startup Ecosystem Report, in large part due to the new policies being developed in recent years, including the Youth Entrepreneurship Act, PIA, and Innovative Startup Act.<sup>50</sup>
- With over 20 million Filipinos registered with a mobile bank or electronic money app and an active regulatory body streamlining fintech experience, access to capital and financial technology services is now in reach of far more Filipinos. Though financing is still a hurdle for many startups, new financial technology products will provide an alternative means for people to access credit. The improving landscape, combined with the government's support for startups, can be a fertile ground to allow more funds to flow into Philippine startups. And there is room for growth: Filipino startups only raised a combined value of USD 307 million compared with Indonesia's USD 4.07 billion in 2018, despite having a more tech-savvy and English-speaking population.<sup>51</sup>
- Entrepreneurship is becoming part of popular culture, as seen in the current television show *The Final Pitch*. Much of the increased interest in entrepreneurship by the general population can be attributed to initiatives from industry, government, and academia. For example, in 2019, there were 33 active DOST-supported TBIs across the country.<sup>52</sup> Furthermore, in 2018, the HEIRIT program trained 20 universities to optimize management of the TBIs.<sup>53</sup> Lastly, CHED's Technopreneurship 101 program in partnership with PhilDev is expected to train over 2,000 professors with trainers from U.S. universities.<sup>54</sup>



**In summary**, stakeholders agree that there is a growing interest in entrepreneurship in the country, and the number of startups continues to grow. The startup scene is still in its infancy but receiving increased support from government, industry, and academia. Areas for future improvement include a reduction of regulatory barriers, an increase in risk capital, and growth of real experience to foster interest and successes via serial entrepreneurship and mentorship. Although entrepreneurship is more popular now, S&T spinoffs remain rare.

"Startups are challenged on the customer side. If [the startup's] customer is the government, the startup has challenges with procurement. If its customer is a large conglomerate, the challenge is that the conglomerate wants to do everything on its own, internally. So the successful startups are the ones targeting consumers and tend not to be [producing] technology-based products, beyond apps."

—Industry

<sup>48</sup> PwC. (2017). Philippine Startup Survey 2017. Retrieved from <https://www.pwc.com/ph/en/ceo-survey/2017/pwc-qbo-2017-philippine-startup-survey.pdf>

<sup>49</sup> Ronquillo, R. M. (2019, June 28). Youth Entrep Act IRR signed. Retrieved from <https://www.pressreader.com/philippines/mindanao-times/20190628/281582357171737>

<sup>50</sup> Kousa, S. (2019, June). How Manila turned around its startup ecosystem. Startup Genome Blog. Retrieved from <https://startupgenome.com/blog/member-spotlight-manila-startup-ecosystem>

<sup>51</sup> E27. (2018). Southeast Asia startup ecosystem report 2018. Retrieved from <https://e27.co/wp-content/uploads/2019/01/e27-Southeast-Asia-Startup-Ecosystem-Report-2018.pdf>

<sup>52</sup> University of Santo Tomas. (2019). UST, DOST launch DOST-TOMASInno technology business incubator. Retrieved from <http://www.ust.edu.ph/uwide-news/ust-dost-launch-tomasinno-technology-business-incubator/>

<sup>53</sup> DOST PCIEERD. (2018). PCIEERD and UP's HEIRIT program kicks off. Retrieved from <http://pcieerd.dost.gov.ph/news/latest-news/310-pcieerd-and-up-s-heirit-program-kicks-off>

<sup>54</sup> PhilDev. (2019). Technopreneurship faculty training. Retrieved from <http://www.phildev.org/technopreneurship-faculty-training>

# Collaboration

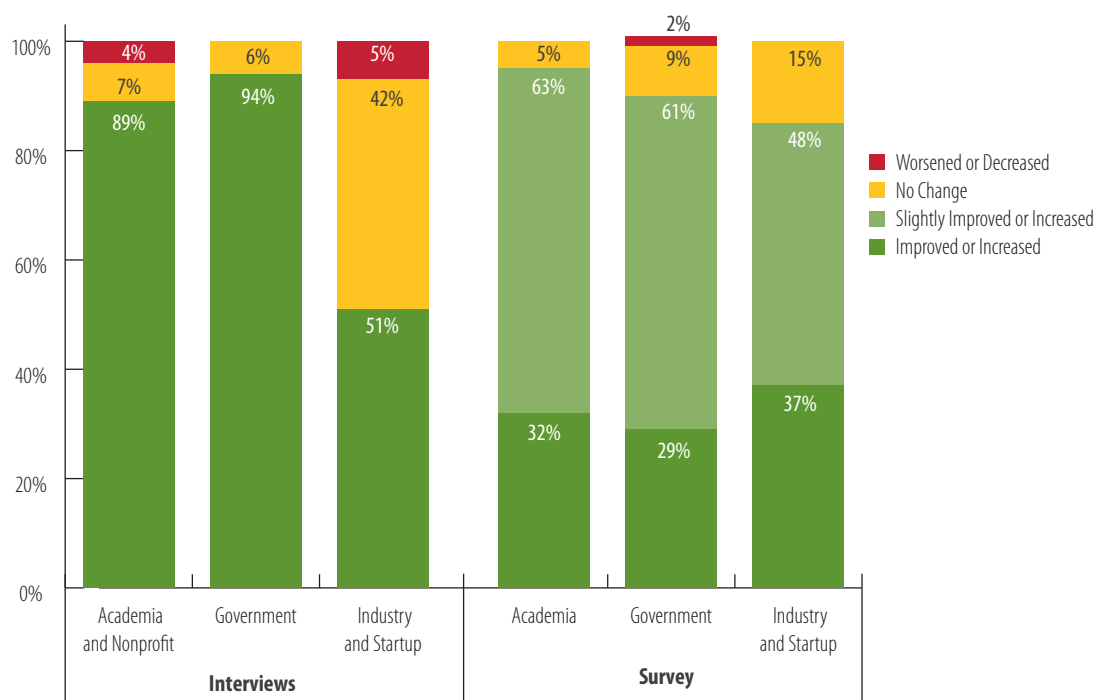


“There’s been improvement in collaboration between academia and government, and to some extent between academia and industry. But between industry and government there is still a need for work.”

–Industry

Collaboration is the underlying element for successful innovation ecosystems. Contemporary innovation studies have found that innovation thrive on a high-trust, collaborative, win-win culture like that found in Silicon Valley.<sup>55</sup> Shared desires for commercial success are common to these cultures. Cooperative norms that include social capital can reduce friction as a result of positive relationships. In 2019, most stakeholders believe collaboration between government and academia is strengthening, as is the link between academia and industry. Cross-government collaboration among DOST, DTI, and DICT is also improving. Although a positive sentiment is associated with collaboration, the absolute level of collaboration is still limited. Linkages among other government agencies are still weak, as is the link between government and industry. Many interviewees from industry voiced a lack awareness regarding key stakeholders and programs in the ecosystem, which hinders potential collaboration. Across the board, interviewees indicated that collaboration had the least change (compared with other elements of the innovation ecosystem). Industry was the most likely to view it as having worsened, as illustrated in **FIGURE 13**. Interviewees were more likely to evaluate it as having worsened or not changed, and most survey respondents said it had only slightly improved.

**FIGURE 13** Of all elements in the innovation ecosystem, interviewees were least positive about the changes in collaboration.



55. RTI International. (2014). Philippine innovation ecosystem assessment, page 4. Retrieved from <https://stride.org.ph/>

# PERSPECTIVES ON SUPPLY

Stakeholders perceived that government–academia, and academia–industry collaborations have improved in the last 5 years. It was voiced that a gap remains in collaboration between government and industry. Industry often cited complex regulations, including restrictions and audit policies, that hinder innovation. Much of industry still has little awareness of, and limited visibility to, innovation initiatives and opportunities. Personal relationships still drive collaboration, with ad hoc results. Programmatic approaches are still nascent or need more time to show impact.

## Enabling Environment

“There is a clearer linkage now between R&D and the overall development thrust of the country and regions, with stronger collaboration among HEIs, concerned national agencies, research consortia, and the private sector.”

–Government

“Collaboration used to be an afterthought; now it’s intentional and something we’re doing based on our vision and mission.”

–Academia

Most stakeholders recognized that cross-agency efforts are starting to drive better alignment between government agencies, most notably between DOST and DTI. Government–academia collaboration has also increased; many new programs and funding vehicles have been implemented in the last 5 years, including the NICER initiative. Collaboration between industry and academia has also improved, being driven mostly by universities’ proactive efforts to reach out to industry. Industry has helped academia improve curricula, develop electives that match industry needs, and better prepare students for the workforce. Recent government programs have been established to further focus on industry–academia collaboration, but their impact remains to be seen.

Unfortunately, university–industry collaboration focused on R&D activities has seen little improvement. Industry is still not aware of the capabilities that universities offer and perceives limited opportunity for collaboration. Also, industry perceives misalignment between their needs and academia’s development efforts, including a mismatch in the pace of work. This perception hinders collaboration between the groups.

Among government agencies, many are still perceived to function individually and “siloed.” More intentional efforts are needed for broader cross-agency collaboration. Furthermore, regulatory barriers continue to create friction and hinder growth of the ecosystem, a factor that impacts all groups.

# PERSPECTIVES ON DEMAND

Stakeholders agreed that there is more awareness and acceptance of the need for collaboration to drive the ecosystem forward. In addition, stakeholders noted more openness to working together, and more proactive steps are resulting with requests for input across stakeholder groups. This was noted as especially true for academia reaching out to industry. Also, stakeholders perceived a marked shift in understanding of the potential associated with cooperation in the ecosystem. Unfortunately, most collaboration is still focused on human capital development and little on R&D. Some pockets of stakeholders are still siloed and view the ecosystem through a competitive lens, and there is a continuing need for real intentionality and progress in aligning efforts.

## Initiatives of Note

- The findings of the 2014 assessment illustrated the sparse engagement between academic institutions and industry. In view of this, there was a need to strengthen networks, linkages, and collaboration among government, industry associations, universities, and research institutions. In 2017, DOST called for proposals for the “Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness” of the S4C Program.<sup>56</sup> Programs of the S4CP include NICER, R&D Leadership Program (RDLead), Collaborative Research and Development to Leverage the Philippine Economy (CRADLE), and Business Innovation through S&T (BIST). NICER aims to capacitate HEIs to do quality research promoting regional development and provide institutional grants for HEIs in the regions for R&D capacity. RDLead aims to secure the services of Filipino experts in the Philippines and abroad by improving the use of research results that will contribute to the socioeconomic development of the Philippines. The CRADLE Program is tasked with creating a synergistic relationship between academia and industry through improvements in R&D collaboration. BIST aims to facilitate the acquisition of strategic and relevant S&T innovative technologies from the private sector.<sup>57,58</sup>
- Starting in 2017, DTI conducted a series of workshops across the country to consider innovation and industrial policy. The inputs received from these workshops were used in the formulation of the recently launched Inclusive Filipinnovation and Entrepreneurship Roadmap.<sup>59</sup> Regional Inclusive Innovation Centers (RIICs), one of the hallmark initiatives under the Roadmap, are being piloted by DTI and DOST with USAID STRIDE assistance in four regions of the Philippines: V, VII, X, and XI. RIICs are meant to address the weak linkages between stakeholders and to serve as a “linchpin of productive collaborations between and among industries, universities, government agencies, LGUs, startups, MSMEs, R&D laboratories, S&T parks, incubators, FabLabs, investors, among other agents in the ecosystem.”<sup>60</sup>

<sup>56</sup> Department of Science and Technology. (2017, June). DOST calls for proposal for NICER, RDLEAD, CRADLE, and BIST program 2017. Retrieved from <http://region12.dost.gov.ph/index.php/announcements/45-announcements/136-dost-calls-for-proposal-for-nicer-rdlead-cradle-and-bist-program-2017>

<sup>57</sup> Department of Science and Technology. (2017). Science for Change Program (S4CP). Retrieved from [http://pcieerd.dost.gov.ph/images/downloads/presentation\\_materials/pcieerd7thanniversary/s4cp.pdf](http://pcieerd.dost.gov.ph/images/downloads/presentation_materials/pcieerd7thanniversary/s4cp.pdf)

<sup>58</sup> Department of Science and Technology. (2018). Science for Change Program (S4CP). Retrieved from [https://caragahealthresearch.net/wp-content/uploads/2018/11/2\\_S4CP-Guidelines.pdf](https://caragahealthresearch.net/wp-content/uploads/2018/11/2_S4CP-Guidelines.pdf)

<sup>59</sup> With the continued implementation and refinement of IFER, the DTI aims to further bolster innovation activities in the country.

<sup>60</sup> Department of Trade and Industry. (2019, October). Policy briefs: The Philippine Filipinnovation and Entrepreneurship Roadmap. Retrieved from <http://industry.gov.ph/wp-content/uploads/2018/12/Inclusive-Filipinnovation-and-Entrepreneurship-Roadmap.pdf>



# IMPACT METRICS

- DOST released a report that outlines more than 100 proposed NICERs in different regions across the Philippines.<sup>61</sup> The proposed expansive nature of the NICERs across every region in the Philippines shows a deep commitment to accelerating industrial competitiveness by capacitating HEIs in the regions to undertake quality research that will subsequently initiate and promote regional development.
- A 2018 study on innovation activities of businesses in the country found that firms hardly accessed technical assistance from the government and HEIs, supporting the perception that improvement has been minimal.<sup>62</sup>
- The RIIC pilot program is showing early impact as seen by the resolutions passed by 3 Regional Development Councils (RDCs), which ensure that RIIC initiatives become part of the regional agendas. These initiatives are being operationalized by local stakeholders such as Chambers of Commerce in Cagayan de Oro and Davao City.



“My impression is that industry works at a specific cadence and [within] set timelines, where it’s imperative to optimize our work. Academia, however, is more ‘free-wheeling’--meaning it has more ‘luxury’ with time. I think there has to be a way to enable researchers, with the right tools, to gain the perspective to work so they can be more useful to industry.”

–Industry

**In summary**, collaboration has improved in terms of cross-government collaboration and academia–industry collaboration. Most stakeholders believe collaboration between government and academia is getting stronger, as is the link between academia and industry. The linkage related to innovation with other government agencies, including CHED and DepEd, still needs improvement. Stakeholders also perceived little change in collaboration between government and industry. Higher awareness about the ecosystem is needed in industry. Industry was also less proactive in engaging the ecosystem, placing a higher responsibility on government and academia to actively reach out. Although an overall positive sentiment was associated with collaboration, more intentional interventions are still needed to drive it further.

<sup>61</sup>. Department of Science and Technology. (2018). Science for Change Program (S4CP). Retrieved from [https://caragahealthresearch.net/wp-content/uploads/2018/11/2\\_S4CP-Guidelines.pdf](https://caragahealthresearch.net/wp-content/uploads/2018/11/2_S4CP-Guidelines.pdf)

<sup>62</sup>. Philippine Institute for Development Studies. (n.d.). PRS 2018-02, Measuring and examining innovation in Philippine business and industry. Retrieved from <https://www.pids.gov.ph/publications/6153>



"Innovation-related policies and laws are better today than [they were] 5 years ago. The Implementing Rules and Regulations (IRR) of RA 10055 (Technology Transfer Laws) were recently approved based on the suggestions of academia, industry, and government. The technology transfer policies of stakeholders will soon be revised to align with the revised IRR."

–Government

"At this point we're not working with government. We try to, but our experience with government has been all restrictions and audits, which is a major deterrent."


–Industry

"We work with universities today, which is an improvement. A couple of years ago we tried to engage a specific university, but it was so layered and full of bureaucracy that the talks froze, and we had to look for alternatives. However, each university has its own structure and processes to handle collaboration, which makes it hard for industry."

–Industry

"We engage with government, but it's always challenging. We walk away because we can't jump through hoops."

–Industry



"'Innovation' in the Philippines is now a buzzword. However, there are still things to improve and enhance in terms of programs and policies. I believe that we are on [the] right track. Government agencies and industry are beginning to see that collaboration with academia can make innovation ecosystems work."

–Academia

"Local government is not as involved in innovation."

–Academia

## Global Performance Metrics

The research team considered global innovation metrics to augment the primary and secondary research related to changes in the Philippine innovation ecosystem 2014–2019. This analysis showed that the Philippines economy has performed well in recent years, achieving a year-on-year growth rate of 6 to 7 percent since 2016 despite increasing global and economic uncertainties.<sup>63</sup> The country's growth forecast of 6 percent is still among the highest in the region even as it faced a recent downward revision of growth projections in 2019.<sup>64</sup> This growth is driven by a strong domestic market and the resurgence of the manufacturing and services sectors growing at an average rate of 7.6 percent and 6.7 percent, respectively, for the period 2010 through 2017.<sup>65</sup>

Moreover, Startup Genome, a management consulting firm focused on building foundations for startups to grow, recognized the potential in the Philippine startup landscape, placing Manila in the Top 10 Global Ecosystems of 2019 in the Bang for Buck category and among the top 5 cities in the category of "activation phase or are still developing," alongside Taipei, Taiwan; Busan, South Korea; Calgary, Canada; and Frankfurt, Germany.<sup>66</sup> The high potential for growth, a favorable demographic in terms of the availability of talent,<sup>67</sup> and the consistently growing economy have been repeatedly cited as factors that make the country's ecosystem attractive.

Although it has achieved exceptional macroeconomic performance, the Philippines still needs to increase focus on fostering innovation among firms and across industries, a critical prerequisite to remaining competitive amid increasing globalization and regional economic integration. More importantly, innovation is crucial in addressing the challenges brought by i4.0 with automation, robotics, AI, and big data threatening Filipino jobs in several key industries.<sup>68,69,70</sup> The Philippines is aware of the need to innovate, and this need has become a regular part of political discourse, with several laws enacted and government initiatives recently implemented to cultivate creativity and collaboration among Filipinos. Stakeholders indicate that these efforts are converging and starting to deliver impact. Progress is likely a result of government agencies acknowledging the deficiencies and working toward investment in areas directly applicable to innovation and economic growth.<sup>71</sup>

As illustrated in TABLE 3, since 2014, the Philippines has moved up 46 places to rank 54<sup>th</sup> out of 129 countries in the 2019 Global Innovation Index (GII), making it the fastest moving economy in the Association of Southeast Asian Nations (ASEAN). The latest report cites improvements in institutions, infrastructure, business sophistication, knowledge and technology outputs, and creative outputs. However, it also cites a prevailing weakness in innovation input, such as human capital development, ease of doing business, and access to capital, areas the government is trying to address with many new programs and investments.

63. Asian Development Bank. (2019). Philippines: Economy. Retrieved from <https://www.adb.org/countries/philippines/economy>

64. De Vera, B. O. (2019, July 25). IMF slashed 2019 growth forecast for PH to 6%. *Philippine Daily Inquirer*. Retrieved from <https://business.inquirer.net/275394/imf-slashed-2019-growth-forecast-for-ph-to-6>

65. Department of Trade and Industry. (2019, October). Policy briefs: The Philippine Innovation and Entrepreneurship Roadmap. Retrieved from <http://industry.gov.ph/wp-content/uploads/2018/12/Inclusive-Filipinnovation-and-Entrepreneurship-Roadmap.pdf>

66. Startup Genome. (n.d.). Philippines. Retrieved from <https://startupgenome.com/ecosystems/manila>

67. Quality was often referred to as including the fact the population is young and educated in English, as is documented at <https://news.mb.com.ph/2019/03/22/a-young-and-growing-population/>.

68. Ordinario, C. (2018, April). Upskilling to cushion impact of automation of Filipino workers in BPOs-expert. *Business Mirror*. Retrieved from <https://businessmirror.com.ph/2018/04/30/upskilling-to-cushion-impact-of-automation-on-filipino-workers-in-bpos-experts/>

69. Gonzales, G. (2017, June). DICT: 48% of employees to be affected by automation. *Rappler*. Retrieved from <https://www.rappler.com/technology/news/164145-dict-salalima-employees-affected-automation>

70. Sino Cruz, I. (2019, June). Around 800K BPO employees may lose jobs by 2024 due to automation. *Cebu Daily News*. Retrieved from <https://cebudailynews.inquirer.net/239091/around-800k-bpo-employees-may-lose-jobs-by-2024-due-to-automation>

71. Department of Trade and Industry. (2018, October). The Philippine Inclusive Filipinnovation and Entrepreneurship Roadmap: Bridging the gaps, setting the milestones. Department of Trade and Industry-Policy Briefs. Retrieved from <http://industry.gov.ph/wp-content/uploads/2018/12/Inclusive-Filipinnovation-and-Entrepreneurship-Roadmap.pdf>. DTI's Undersecretary Rafaelita M. Aldaba, citing reports from World Economic Forum and others, states that the Philippines invests far less than other ASEAN countries in R&D and that it also lacks the human capital necessary to support innovation and commercialization. She further states that the country's research productivity and the number of IP applications remain low and that collaboration between industry and academia remains weak.

TABLE 3 ASEAN Global Innovation Index Rankings, 2014–2019.

	2014	2015	2016	2017	2018	2019	Change 2014–2019
<b>Singapore</b>	7 <sup>th</sup>	7 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	5 <sup>th</sup>	8 <sup>th</sup>	1 ▼
<b>Malaysia</b>	33 <sup>rd</sup>	32 <sup>nd</sup>	35 <sup>th</sup>	37 <sup>th</sup>	35 <sup>th</sup>	35 <sup>th</sup>	2 ▼
<b>Vietnam</b>	71 <sup>st</sup>	52 <sup>nd</sup>	59 <sup>th</sup>	47 <sup>th</sup>	45 <sup>th</sup>	42 <sup>nd</sup>	29 ▲
<b>Thailand</b>	48 <sup>th</sup>	55 <sup>th</sup>	52 <sup>nd</sup>	51 <sup>st</sup>	44 <sup>th</sup>	43 <sup>rd</sup>	5 ▲
<b>Philippines</b>	100 <sup>th</sup>	83 <sup>rd</sup>	74 <sup>th</sup>	73 <sup>nd</sup>	73 <sup>nd</sup>	54 <sup>th</sup>	46 ▲
<b>Brunei</b>	88 <sup>th</sup>			71 <sup>st</sup>	67 <sup>th</sup>	71 <sup>st</sup>	17 ▲
<b>Indonesia</b>	87 <sup>th</sup>	97 <sup>th</sup>	88 <sup>th</sup>	87 <sup>th</sup>	85 <sup>th</sup>	85 <sup>th</sup>	2 ▲
<b>Cambodia</b>	106 <sup>th</sup>	91 <sup>st</sup>	95 <sup>th</sup>	101 <sup>st</sup>	98 <sup>th</sup>	98 <sup>th</sup>	8 ▲

NOTE: ASEAN member-states Myanmar (Burma) and Laos are not ranked in GII for the selected years. Brunei was not ranked in the GII in 2015 and 2016.

Source: Cornell University, INSEAD, and WIPO. (2019). The Global Innovation Index 2019: Creating Healthy Lives—The Future of Medical Innovation, Ithaca, Fontainebleau, and Geneva. Retrieved from [https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

“The problem is that many proposed policies are more of a threat to industry than a blessing. Some regulations lack a scientific basis, and some are driving away foreign direct investment.”

–Industry

In 2017, STRIDE completed a needs assessment specific to the technology sector in the Philippines.<sup>72</sup> As part of that effort, various innovation indicators<sup>73</sup> were considered in comparison to a set of countries that were selected as either aspirational (e.g., South Korea, Israel), competitive (e.g., Indonesia, Vietnam), or regional (e.g., Malaysia, Cambodia). For this study, we updated the same set of indicators and countries using the latest data. The indicators also demonstrate the change in performance from 2014 to 2019 for the Philippines. These comparative analysis are organized by indicators of positive economic trajectory in [FIGURE 14](#) and weak economic momentum in [FIGURE 15](#).

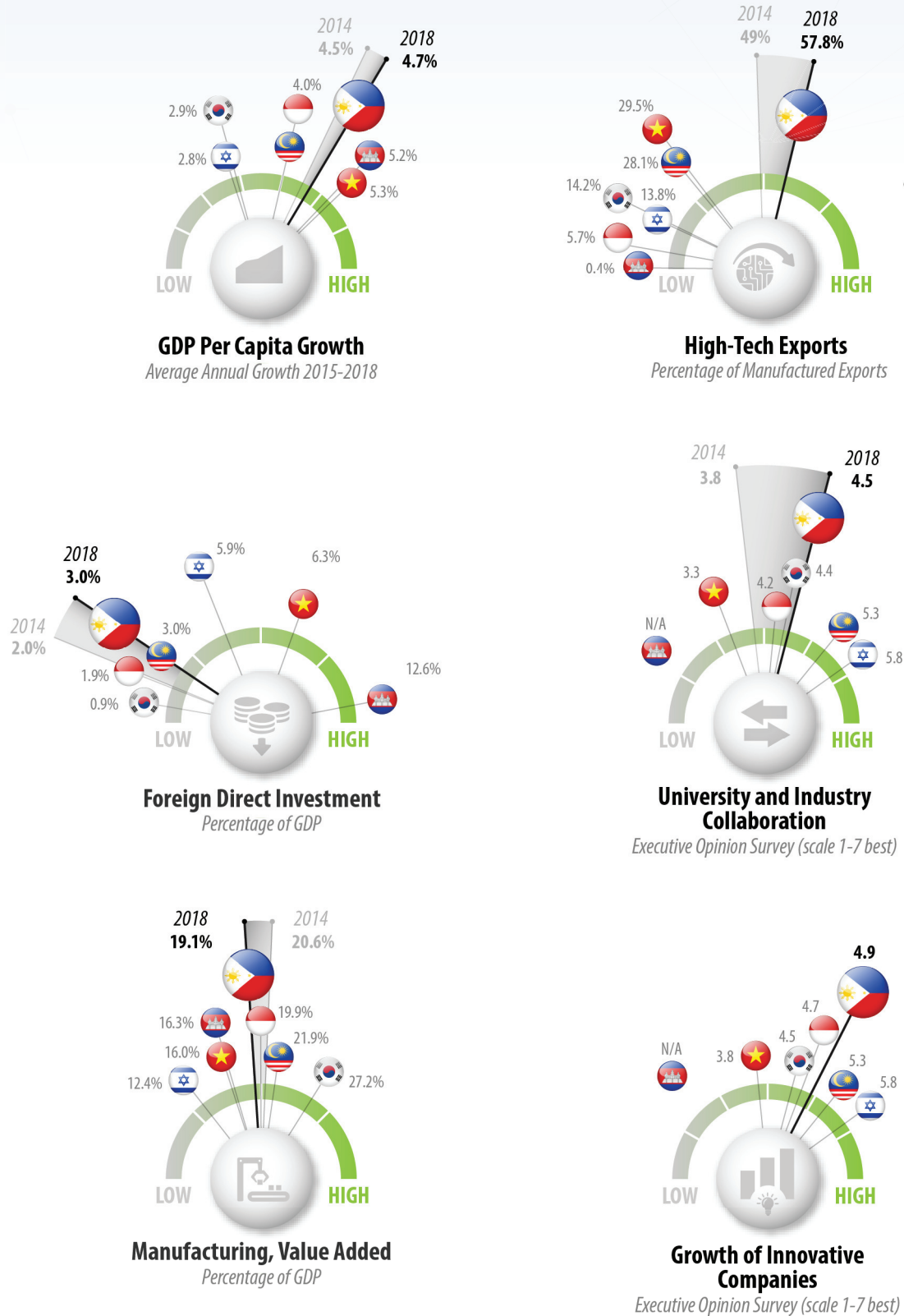
## Indicators of Positive Economic Trajectory ([FIGURE 14](#))

- **Gross Domestic Product (GDP)/Capita Growth.** This analysis used data from the World Bank and presents the comparison of average annual growth of GDP per capita from 2015 through 2018 for the selected countries. GDP/capita is an indicator of an economy's health. Over a 3-year period, the Philippines GDP/capita grew by an average of 4.7 percent, indicating rapid growth that is outpacing many Southeast Asian peers but behind Cambodia and Vietnam.
- **High-Tech Exports** *as a percentage of manufactured exports.* These data, collected by UN Comtrade, estimate the percentage of manufacturing exports that fit into "high-tech" categories. This percentage highlights the role of the high-tech industry within a country's manufacturing economy. From 2014 through 2018, the percentage of manufactured exports considered high-tech increased from 49 percent to 58 percent, making the Philippines a regional leader in high-tech manufactured exports. Although the value add of manufacturing as a percentage of GDP declined, manufacturing became more specialized and more high-tech.
- **Foreign Direct Investment (FDI)** *as a percentage of GDP.* This ratio is used to look at the impact that foreign investment plays in an economy. For emerging economies, the impact of foreign investment can be critical to enable development and growth (e.g., Cambodia). For more mature economies (e.g., South Korea), this value may be lower because of high levels of domestic private and public investment. These data are from the World Bank. For many export-oriented economies, a high level of FDI as a percentage of GDP indicates openness to foreign trade and ease of investment. From 2014 through 2018, the FDI as a percentage of GDP increased from 2 percent to 3 percent.
- **University and Industry Collaboration.** From the World Economic Forum Executive Opinion Survey, business executives evaluate their perceptions of university–industry collaboration on a scale from 1 to 7. From 2014 through 2018, this value increased from 3.8 to 4.5, placing the Philippines behind only Israel and Malaysia. This is a large increase in the perception of university–industry collaboration, indicating a shifting opinion toward its effectiveness in the country.
- **Manufacturing Value Added** *as a percentage of GDP.* Manufacturing value added, collected by the World Bank, is the net output of manufacturing (minus intermediate inputs), calculated as a share of total GDP. From 2014 through 2018, the manufacturing value added declined from over 20 percent to 19.1 percent, an indication that manufacturing is making up a smaller share of GDP. Highly productive manufacturers such as South Korea (27.2 percent) and Malaysia (21.9 percent) have value added that outpaces the Philippines, while service-oriented economies like Israel (12.4 percent) derive less of their GDP from manufacturing. A decline in manufacturing value add combined with an increase in high-tech manufactured exports indicate a transition to a more technology-oriented service economy with a smaller percentage of basic manufacturing.
- **Growth of Innovative Companies.** This is a new question in the World Economic Forum Executive Opinion Survey. According to executives, the Philippines has a strong growth of innovative companies, rating it, on average, as a 4.9 out of 7. This ranks the Philippines behind only Israel and Malaysia.

72. USAID and RTI International. (2017). *Driving innovation to deliver economic value: A needs assessment of the Philippines' technology sector*. Retrieved from [http://www.stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector\\_UpdatedLayout.pdf](http://www.stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector_UpdatedLayout.pdf)

73. For more detail, see Hogan, M. Q., & Gallaher, M. (2018). *Quantitative indicators for country-level innovation ecosystems*. (RTI Press Publication No. OP-0051-1805). Research Triangle Park, NC: RTI Press. <https://doi.org/10.3768/rtipress.2018.op.0051.1805>

FIGURE 14 Several innovation performance indicators highlight the Philippines as competitive with regional and aspirational peers.

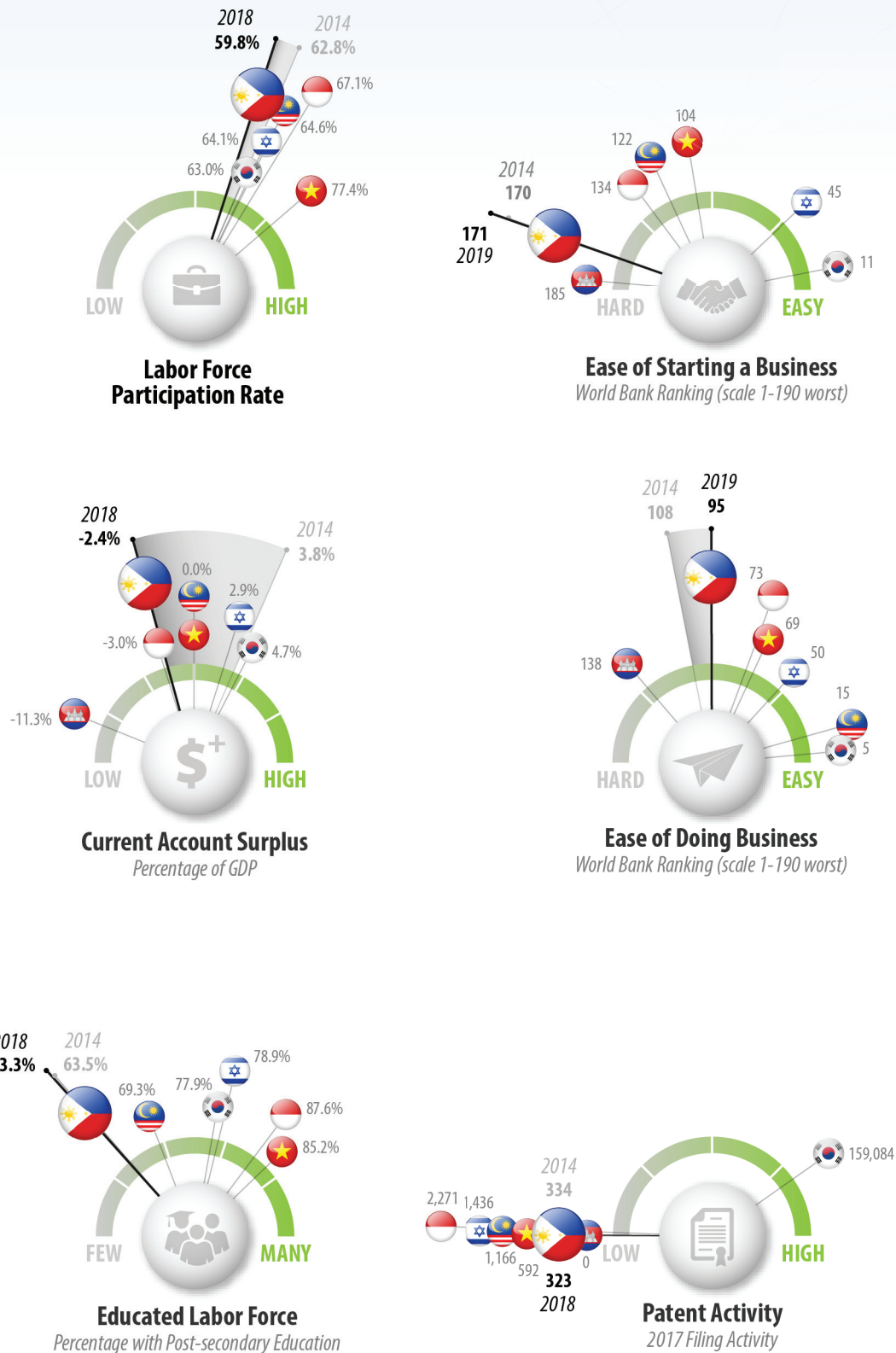


## Indicators of Weak Economic Momentum (FIGURE 15)

- **Labor Force Participation Rate.** The labor force participation rate, collected by the International Labour Organization and shared by the World Bank, represents the percentage of the working-age population that is economically active and working. From 2014 through 2018, labor force participation declined from nearly 63 percent to below 60 percent, an indication that fewer individuals are participating in the formal labor force. This ranks the Philippines lowest among the comparison countries.
- **Ease of Starting a Business.** This variable is also based on a World Bank rating (rank ordered from 1 to 190) and important in fostering entrepreneurs to have an impact on the economy. It is one of the facets included in the World Bank Ease of Doing Business rating. For this indicator, the Philippines and its ASEAN counterparts are all well away from more mature innovation economies like South Korea and Israel. From 2014 to 2019, the Philippines effectively remained flat, at 170 to 171. The Philippines remains one of the most difficult countries in the region and in the world to start a business.
- **Current Account Surplus as a percentage of GDP.** Current accounts represent net exports, international investments, and balance of payments from other countries. A positive current account balance is associated with being a net exporter and/or lender to other nations. Data from the World Bank from 2014 through 2018 show the Philippines went from a 3.8 percent surplus to a 2.4 percent deficit, meaning the country went from a net lender to a net borrower.
- **Ease of Doing Business.** This variable is based on a World Bank rating that considers multiple facets of doing business, including permitting, infrastructure, property laws, access to credit, taxes, import/export, contracts, and insolvency laws/process. The three countries selected to gain insight—South Korea, Malaysia, and Israel—all rank high on this score. From 2014 through 2019, the Philippines rose from 108th to 95th, yet it still only ranked ahead of Cambodia when compared with local peers. This sign is a concern, suggesting that the business environment is getting more difficult compared with regional and global trends.
- **Educated Labor Force.** Qualified human capital with advanced education is central to the growth of an innovation ecosystem. The Philippines is losing momentum in human capital: the percentage of the labor force with advanced education declined slightly from 2014 to 2018, with 63.3% of adults in the labor force holding a post-secondary degree. This is the lowest among all the peer nations and represents a challenge for the country's continued growth as a knowledge economy.
- **Patent Activity.** Protection of IP has been tied to innovation and economic prosperity. This analysis includes patent applications by residents, both domestic patents in national offices and global patents filed through the Patent Cooperation Treaty. The data represent patent filings tracked by the World Intellectual Property Organization. In 2017, Filipino residents filed 323 patents, a slight decline from 334 in 2014. This number ranks as low, especially compared with South Korea (over 159,000 patents in 2017) and Indonesia (2,271).

**In summary,** GDP per capita growth, ease of doing business, FDI, high-tech exports, and university and industry collaboration have seen significant positive shifts since 2014. Conversely, labor force participation, patent activity, manufacturing value added, current account surplus, and ease of starting a business have experienced limited improvement or decreased performance. The decline in manufacturing value coincides with an increase in high-tech exports of manufactured goods, which signals that the Philippines is transitioning away from lower value-add manufacturing to high-tech manufacturing and services. Human capital will remain an ongoing challenge as the country continues its move towards high-tech manufacturing and services. Low rates of labor force participation and a lack of growth in workers with post-secondary education represent areas that need to improve for the country to continue growing as a knowledge economy.

FIGURE 15 Other innovation indicators highlight the Philippines' limitations as a business environment.



## CHAPTER 4: CONCLUSIONS AND PATHWAYS FORWARD

In 2014, USAID STRIDE completed the “inaugural” assessment of the innovation ecosystem in the Philippines. Since then, two additional assessments have added insight in the specific areas of agriculture and high-tech industries.<sup>74</sup> These reports bring forward perspectives of stakeholders about efforts and their impacts. Each of these research efforts leveraged the RTI innovation ecosystem model to consider key elements of success to help people work together toward economic impact enabled by science, technology, and research.

During the period of these assessments, the Philippines has strived for “inclusive innovation” with a goal of growing and developing globally competitive and innovative industries by improving the innovation and entrepreneurship ecosystem, removing obstacles to growth, and strengthening industry clusters and the needed domestic supply of talent and resources.<sup>75</sup> Economic development theory generally acknowledges that for success in these areas, political, institutional, technological, cultural, and geographic factors all play a role.<sup>76</sup> This study used interviews and a survey to probe these factors and bring forward relevant insights using the innovation ecosystem framework.

74. RTI International reports. Philippines innovation ecosystem assessment (2014). Retrieved from <https://stride.org.ph/wp-content/uploads/2016/07/Full-Report.pdf>; Driving innovation to deliver economic value: A needs assessment of the Philippines' technology sector (2017). Retrieved from [https://stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector\\_UpdatedLayout.pdf](https://stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector_UpdatedLayout.pdf); Agribusiness innovation ecosystem assessment (2017). Retrieved from <https://stride.org.ph/wp-content/uploads/2019/03/PH-Agribusiness-Innovation-Ecosystem-Assessment.pdf>

75. Department of Trade and Industry. (2019, October). Policy briefs: The Philippine Filipinnovation and Entrepreneurship Roadmap. Retrieved from <http://industry.gov.ph/wp-content/uploads/2018/12/Inclusive-Filipinnovation-and-Entrepreneurship-Roadmap.pdf>, p. 2.

76. Sachs, J. (2012). Reply to Acemoglu and Robinson's response to my book review.

**Overall, the innovation ecosystem has improved across all elements of the ecosystem, yet stakeholders widely agreed that many needs and opportunity areas must be addressed to continue to build forward the Philippines' global competitiveness.**

“The Philippines has made improvements, but we're not even in catch-up mode yet.”

—Industry

The interviews and survey input from hundreds of stakeholders build to the following conclusions for each ecosystem element.



**Human capital and education have improved, but more alignment is needed with industry needs:** It is widely held that there is a significant talent gap. At present, the skillset of university graduates does not meet the needs of industry, forcing many companies to invest in developing internal programs to train new hires. Talent is still leaving the country, there are few expats coming in, which is limiting any impact from foreign talent (e.g., professors), and there are few Balik Scientists to act as role models. For multinational corporations, this talent pipeline limits their options in the Philippines and results in more production and less research. The educational reforms aimed at addressing the talent gap (e.g., K-12 shift, college tuition support) are positive, yet to meet the needs of industry for innovation are limited by existing regulations on curriculum development.



**Knowledge creation has improved, but government funding and connection to industry need more intentionality:** There has been an improvement on government funding for research, but not to the level that is recommended by UNESCO.<sup>77</sup> Government still underspends on R&D, a point that was made by DTI Undersecretary Rafaelita Aldaba in 2018, “To effectively and properly implement our activities and programs, we need to put funds into these activities. We need to put our money where our mouth is so please help us secure a budget or come up with a legislation on this.”<sup>78</sup> Beyond having funding available, multiple stakeholders mentioned that the difficult regulatory and bureaucratic processes to access these funds disincentivize researchers and organizations from pursuing them. Furthermore, industry participation in R&D remains low. A major barrier that was highlighted in the 2014 report and remains unchanged is the difficult procurement process, which has a high negative impact on R&D.



**Knowledge transfer has improved, but more work is needed to impact all stakeholder groups:** There have been significant efforts toward this variable by both government and academia, which was recognized; however, many stakeholders, particularly in industry, voiced limited awareness about activities and initiatives taking place in the ecosystem. This lack of visibility includes capabilities offered at regional and national universities. Industry still perceives misalignment of the R&D (and resulting IP) work being done by academia with their real needs.



**Entrepreneurship is gaining in popularity, but more time and support are required to drive real impact:** Recent regulations aim to facilitate the creation and growth of enterprises in the country; however, at the time of this writing, the challenges that have hindered growth remain. Awareness about entrepreneurship has grown, yet many startup founders still seek more amicable business environments outside of the country. Beyond just technology startups, Filipino MSMEs show low rates of innovation. Although new policies aimed at supporting MSMEs were established in recent years, including the MSME Development Plan 2017-2022 by DTI, the financial support to lower risks associated with innovation activities remains low. A recent study<sup>79</sup> on Philippine MSME policies recommends introduction of instruments that promote collaboration as a way to support MSME innovation. The recommendation is in line with findings from our interviews where stakeholders often discussed limited opportunities for industry and academia to undertake collaborative R&D. Funding opportunities were cited as a major barrier, as well as the bureaucratic burden that accompanies existing opportunities, which were often enough to prevent industry’s willingness to engage these projects.



**Collaboration has improved in terms of relationship building but cultural differences (e.g., speed, risk) across stakeholder groups are still a barrier:** There has been improvement in university–industry collaboration, mainly driven by proactive efforts initiated by academia; however, speed mismatch between university and industry and an inability to align incentives are still limiting. No improvement was perceived by the stakeholders in collaboration between industry and government with industry still seeing government as a barrier.

<sup>77</sup> UNESCO. (2013). Data for the sustainable development barrier goals. Retrieved from <http://uis.unesco.org>

<sup>78</sup> Republic of the Philippines, Philippine Institute for Development Studies. (n.d.). PH gov’t support to R&D, inadequate—Experts. Retrieved from <https://www.pids.gov.ph/press-releases/419>

<sup>79</sup> World Bank Group. (n.d.). Philippines: Assessing the effectiveness of MSME and entrepreneurship support. Retrieved from <http://documents.worldbank.org/curated/en/853041563828559514/pdf/Philippines-Assessing-the-Effectiveness-of-MSME-and-Entrepreneurship-Support.pdf>

Reflecting specifically on the findings from 2014, we can highlight that for the 4 cross-cutting “chains of impact” we conclude that

- **Procurement regulations** still need improvement. This was the one element that has seen the least progress.
- **Cofunding structures** have improved with some universities building pathways to enable work with industry; however, this is still an issue for many organizations.
- **Inflated patent licensing revenue expectations** are now being discussed in light of the government’s establishing an FOB. The view on this board is mixed, and in reality, the flow of deals is still limited; thus, real negotiations and valuations are not common, and expectations are likely shifting toward reality with time.
- **Environment of mistrust** is shifting toward one of greater connection and understanding, which is foundational to trust. The environment of collaboration has seen significant improvement in developing networks among stakeholders. However, the connection between industry and government has changed little.

Since 2014, the Philippines has continued to work toward an inclusive innovation ecosystem that allows and encourages participation of the majority of people in economic activities to make the best use of their talents. Institutions that are inclusive “feature secure private property, an unbiased system of law, and a provision of public services that provides a level playing field in which people can exchange and contract.” The Philippines’ path toward inclusivity aligns with the concept that “Nations fail today because their extractive economic institutions do not create the incentives needed for people to save, invest, and innovate.”<sup>80</sup>

Reflecting on this philosophy and the Philippines’ institutions that affect innovation, it is clear that the Philippines is still missing incentives and security to drive significant innovation. Participation and success are hampered by changing agendas and opinions resulting from changing leadership. This instability affects stakeholders’ behaviors, including decisions to invest in innovation. In 2019, we recognize key challenges that remain, yet for most challenges there is optimism that the PIA and the Innovation Startup Act will help. However, the potential impact of these important pieces of legislation is still hard to gauge because the real impact will depend greatly on how well they are implemented.

<sup>80</sup>. Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity and poverty* (1st Ed.), New York: Crown, pp. 372 and 144. Their definition of inclusive institutions necessitates that broad swathes of a country’s population must be included in economic activity. The presence of private property creates incentives for citizens to achieve success in the long term. This, combined with a system that includes the bulk of the population, allows for a system that achieves near-maximum utility of its human and physical resources.

“The gap is mainly because of differences in KPIs [key performance indicators]. Industry prioritizes value creation; academia prioritizes knowledge creation; and government prioritizes impact. If the connections are not planned right, the gap broadens, and conflicts come up.”

–Academia

In light of the research in 2014 and in 2019 related to the continued improvement of the Philippines' innovation ecosystem, stakeholders must take steps to continue on a pathway of progress.<sup>81</sup> Continued efforts should

- **Resource the Philippines for global competition.** One opportunity is to think more globally and remove barriers for investment, including international input into the ecosystem that includes enabling
  - greater government investment toward research and social improvements that will help fund innovative technologies and products, as well as create markets
  - credit financing<sup>82</sup>
  - foreign investment to support innovation and growth, including tax incentives for research, export, and zone entities
  - access to foreign talent,<sup>83</sup> especially visiting professors
  - ownership in businesses beyond 50 percent
- **Increase and optimize R&D investments** (government, industry, and academia) by
  - increasing expenditures in research to meet/exceed the 1 percent of GDP target
  - revising mechanisms for industry-government R&D in terms of programs and licensing to create real access for startups and other corporate entities
  - empowering impactful research in universities with greater administrative support and balance of teaching vs. research load
- **Continue to foster the environment for startups and spinoffs** toward real impact by
  - lowering regulatory barriers
  - developing a risk capital ecosystem that includes investor protection, cofunding mechanisms, and a credit/banking system to develop angel investing and beyond<sup>84</sup>
- **Continue to increase collaboration**, across stakeholder groups and across the government. For the government, this includes elimination of overlapping programs to reduce confusion and improve efficiency and impact.<sup>85</sup>
  - increase visibility of initiatives and opportunities for collaboration across the ecosystem, especially enabling more frequent and higher quality engagements with industry

The assessment of the Philippines' innovation ecosystem from 2014 to 2019 indicates improvement. This momentum now needs to be enabled to continue to grow with unification of legacy and future plans, policies, and programs into a concrete strategy. The strategy should continue to drive forward clear goals that are aligned with financial and legislative realities. Beyond having clear goals, the country needs to drive toward real measurement and evaluation of initiatives in the innovation ecosystem, including programs and policies, as a basis for continuous and sustainable improvement. The framework/mechanism used in this study offers insights and can be leveraged to continue to gather data, feedback, and suggestions from stakeholders to continue the drive toward a stronger innovation ecosystem in the Philippines.

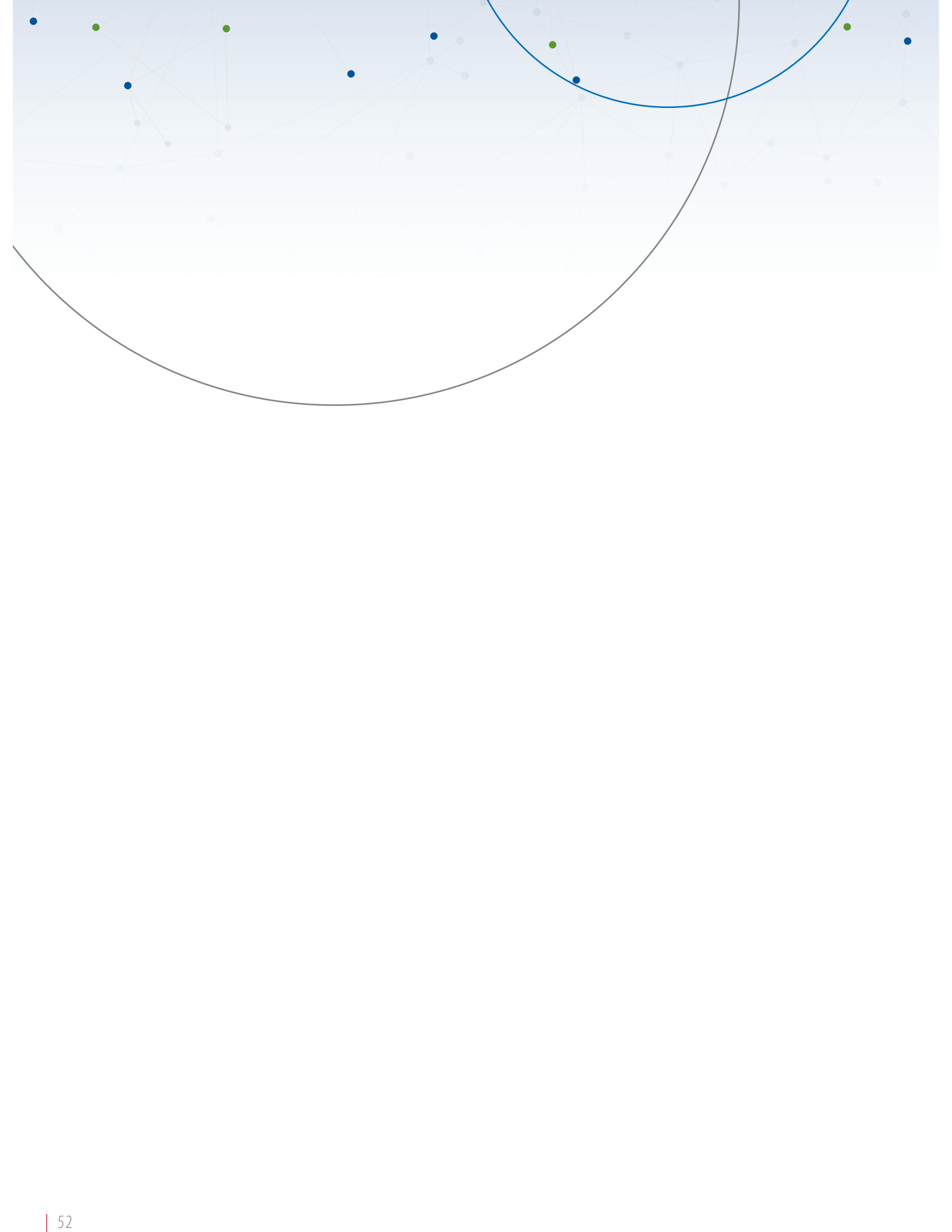
<sup>81</sup> The results of this assessment reinforce the DTI's Inclusive Innovation Industrial Strategy (i3S) that focuses on the "triple helix model" of industry-academia-government. <http://industry.gov.ph/wp-content/uploads/2017/11/DTI-Policy-Brief-2017-05-Philippine-Inclusive-Innovation-Industrial-Strategy.pdf>

<sup>82</sup> Sec. 22 of the PIA has the innovation development and credit financing section and also Sec. 23 that has a credit quota that speaks about banks setting aside around 4 percent of total loanable funds for innovation credit—with some associated stipulations.

<sup>83</sup> There is a provision for a startup visa in the Innovative Startup Act, and the PIA has provisions related to the Filipino diaspora. Section 12. Startup Venture Fund. There is hereby created a Startup Venture Fund (SVF) under the DTI, to be administered in coordination with the National Development Company (NDC). The SVF shall be used to match investments by selected investors in startups based in the Philippines.

<sup>84</sup> The Innovation Startup Act has an Innovative Startup Venture Fund (to be administered by DOST) in the amount of 10 billion pesos (P10,000,000,000.00) to cover for initial or supplemental grants-in-aid for innovative startups and support service providers. Also, the PIA Sec. 21 refers to the innovation fund, which aims to strengthen entrepreneurship and enterprises to develop innovative solutions.

<sup>85</sup> Government convergence is a clear goal of the PIA.



## APPENDICES

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## APPENDIX A. STAKEHOLDER ORGANIZATIONS INTERVIEWED

Organizations Interviewed	Regions				Type					Interview History		Multi Orgs
	NCR	VII	X	Other	Priv. Univ.	Pub. Univ.	Gov	Ind	Other	2014	2017	
Abad Alcantara and Associates												
Aerospace Industry Association of the Philippines (AIAP)												
Analytics Association of the Philippines (AAP)												
Asian Institute of Management (AIM)												
AXA Philippines												
Ayala Corporation												
Boysen												
Cagayan Electric Power and Light Company Inc. (CEPALCO)												
Carella Management												
Carmen's Best Ice Cream												
Cebu Chamber of Commerce												
Cebu Institute of Technology (CIT)												
Cebu IT BPM.Organization (CIB.O) (formerly CEDFIT)												
Cebu Technological University (CTU)												
De La Salle - College of St. Benilde / Hub of Innovation for Inclusion (HiFi)												
De La Salle University (DLSU)												
Del Monte Pacific												
Department of Science and Technology (DOST)												
Department of Science and Technology (DOST) - Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD)												
Department of Science and Technology (DOST) - Region VII												
Department of Science and Technology (DOST) - Region X												
Department of Science and Technology (DOST) - Science for Change Program (S4CP)												
Department of Trade and Industry (DTI) - Region VII												
Department of Trade and Industry (DTI) - Region X												
Emerson Electric Asia												
EMS Components												
FabLab Mindanao												
Famous Secret												
Far Eastern University (FEU)												
First Philippines Holding Corporation												
Holy Angel University												
Hustle Ground Ventures												
Iloilo Science & Technology University (ISATU)												
Inquirer Media												
Integrated Micro-Electronic Inc. (IMI)												
Ionics												

Organizations Interviewed	Regions				Type					Interview History		Multi Orgs
	NCR	VII	X	Other	Priv. Univ.	Pub. Univ.	Gov	Ind	Other	2014	2017	
Kalibrr												
Kickstart Ventures												
Knowledge Channel												
Knowles												
Livable Cities Challenge												
Makati Business Club												
Maxim				Cavite								
Micab.co												
Microsoft												
Mindanao State University - Iligan Institute of Technology (MSU-IIT)												
Monde Nissin Corporation												
Moog Controls Corporation				Baguio								
Narra VC												
National Economic Development Authority (NEDA)												
Nestlé												
Nutra Tech				Cavite								
Pascual PharmaCorp												
Payruler												
PhilDev												
Pilipinas Shell Foundation												
Philippine Association of State Universities and Colleges (PASUC)												
Philippine Business for Education (PBE)												
Philippine Institute for Development Studies (PIDS)												
QBO Innovation Hub												
Semiconductors and Electronics Industries (SEIPI)												
Smart Communications												
Social Innovation Consultant												
Steel Asia												
StreetPark Productions												
Technological Institute of the Philippines (TIP)												
TechTalks.ph												
The Philippine Software Industry Association (PSIA)												
Thinking Machines												
University of Cebu - Beehive Accelerator												
University of San Carlos (USC)												
University of the Philippines - Cebu												
University of Science and Technology of the Southern Philippines (USTP)												
USAID STRIDE												

## APPENDIX B. SURVEY QUESTIONS

The survey instrument used in the research was SurveyGizmo (<https://www.surveygizmo.com>). Survey respondents were introduced to the innovation ecosystem models and asked the questions below.

1. **Pick the top 3 elements you think are most important for innovation to be successful in the Philippines.**

- **Human Capital & Education**—Think about the quality and quantity of the workforce as they transition from education to the workforce, and how they understand and can support research, entrepreneurship, and innovation.
- **Research & Knowledge Creation**—Think about basic, applied, and translational research and development taking place at universities, government research laboratories, and industry.
- **Knowledge Transfer**—Think about quantity and quality of intellectual property being developed and transferred via licensing or commercialized via startups and spinoffs.
- **Startups and Spinoffs**—Think about the number and quality of innovative new companies being formed and funded.
- **Collaboration**—Think about information sharing and trust between government, industry, and academia, and the networks/relationships among the individuals (social capital).

2. **RATE, for each, how you think it has changed since 2014. REMEMBER: this is about innovation. Note: survey respondents were only asked to rate the top 3 choices made in question 1.**

- **Human Capital & Education**—people ready to support innovation.
  - I. Significantly Worsened / Decreased
  - II. Slightly Worsened / Decreased
  - III. No Change
  - IV. Slightly Improved / Increased
  - V. Significantly Improved / Increased
  - VI. I can't say / I don't know
  - ✓ (Optional) Why?
- **Research & Knowledge Creation**—R&D at universities, industry, and the government.
  - I. Significantly Worsened / Decreased
  - II. Slightly Worsened / Decreased
  - III. No Change
  - IV. Slightly Improved / Increased
  - V. Significantly Improved / Increased
  - VI. I can't say / I don't know
  - ✓ (Optional) Why?
- **Knowledge Transfer**—licensing and commercialization of innovation that's developed in academia, industry, and government.
  - I. Significantly Worsened / Decreased
  - II. Slightly Worsened / Decreased
  - III. No Change
  - IV. Slightly Improved / Increased
  - V. Significantly Improved / Increased
  - VI. I can't say / I don't know
  - ✓ (Optional) Why?
- **Startups and Spinoffs**—new innovative companies being formed and funded.
  - I. Significantly Worsened / Decreased
  - II. Slightly Worsened / Decreased
  - III. No Change
  - IV. Slightly Improved / Increased
  - V. Significantly Improved / Increased
  - VI. I can't say / I don't know
  - ✓ (Optional) Why?
- **Collaboration**—universities, industry, and government working together.
  - I. Significantly Worsened / Decreased
  - II. Slightly Worsened / Decreased
  - III. No Change
  - IV. Slightly Improved / Increased
  - V. Significantly Improved / Increased
  - VI. I can't say / I don't know
  - ✓ (Optional) Why?

3. **Innovation-related policies/laws are better today than they were 5 years ago.**

- Strongly Disagree
- Slightly Disagree
- Neutral
- Slightly Agree
- Strongly Agree
- I can't say / I don't know

✓ (Optional) Why?

4. **Innovation programs are better today than they were 5 years ago.**

- Strongly Disagree
- Slightly Disagree
- Neutral
- Slightly Agree
- Strongly Agree
- I can't say / I don't know

✓ (Optional) Why?

5. **RATE, for each, how you think it has changed since 2014.**

- **Procurement Regulations**—modifications to laws, creation of new policies and programs for research activities to be faster, more efficient, and relevant.

- I. Significantly Worsened / Decreased
- II. Slightly Worsened / Decreased
- III. No Change
- IV. Slightly Improved / Increased
- V. Significantly Improved / Increased
- VI. I can't say / I don't know

✓ (Optional) Why?

- **Counterpart Funding Structures**—for government grants to incentivize research at universities.

- I. Significantly Worsened / Decreased
- II. Slightly Worsened / Decreased
- III. No Change
- IV. Slightly Improved / Increased
- V. Significantly Improved / Increased
- VI. I can't say / I don't know

✓ (Optional) Why?

– **Licensing Revenue Expectations** —

alignment between expectations and reality (based on benchmarks).

- I. Significantly Worsened / Decreased
- II. Slightly Worsened / Decreased
- III. No Change
- IV. Slightly Improved / Increased
- V. Significantly Improved / Increased
- VI. I can't say / I don't know

✓ (Optional) Why?

6. **What else do you want to share about changes in the Philippine Innovation Ecosystem over the past 5 years? Programs, policies, etc.?**

# APPENDIX C. 2014 ASSESSMENT CRITERIA

Supply of Talent	Demand	Enabling Environment
<b>1. Education and Human Capital</b>		
Quality and quantity of training:	Demand for STEM skills:	Rules, regulations, and enablers, including:
<ul style="list-style-type: none"> <li>• Postgraduate STEM training</li> <li>• Undergraduate STEM training</li> <li>• Technical training (TESDA)</li> <li>• Foundational STEM education</li> </ul>	<ul style="list-style-type: none"> <li>• Returns to education</li> <li>• Student &amp; family preferences</li> <li>• Employers – domestic in PH</li> <li>• Employers – foreign in PH</li> <li>• Employers – overseas</li> </ul>	<ul style="list-style-type: none"> <li>• Accreditation and standards</li> <li>• Results-based quality control</li> <li>• Labor market information (occupational &amp; demand)</li> <li>• Education finance</li> </ul>
<b>2. Research and Knowledge Creation</b>		
<ul style="list-style-type: none"> <li>• Researchers, graduate students, university research labs, research networks and centers of excellence, research management capabilities, corporate/business R&amp;D, private research entities, government research centers, international research networks including PH</li> </ul>	<ul style="list-style-type: none"> <li>• Government funding agencies</li> <li>• Domestic private-sector funders and collaborators</li> <li>• International private-sector funders and collaborators</li> <li>• International academic/foundation/multilateral funders and funding networks</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory framework</li> <li>• Specific regulatory barriers (procurement/purchasing)</li> <li>• Institutional support systems and rules/incentives (e.g., costing research)</li> <li>• Inter-university networks for research collaboration</li> </ul>
<b>3. Knowledge Transfer</b>		
<ul style="list-style-type: none"> <li>• Applied research services</li> <li>• Technology extension services</li> <li>• Other services to industry</li> <li>• Commercially viable IP</li> <li>• Assessment of market viability</li> <li>• Marketing expertise</li> <li>• ITSOs and peers</li> <li>• IP protection expertise (disclosure through international protection)</li> </ul>	<ul style="list-style-type: none"> <li>• Technology users/acquirers in industry – PH</li> <li>• Technology users/acquirers in industry – international</li> <li>• Business licensing expertise</li> <li>• Open innovation strategies</li> <li>• Entrepreneurs – PH</li> <li>• Entrepreneurs – international</li> </ul>	<ul style="list-style-type: none"> <li>• Legal/institutional framework (permission and rewards)</li> <li>• Quality of the relationship framework</li> <li>• Patenting regime</li> <li>• IP law</li> <li>• IP enforcement</li> <li>• Court/judicial system</li> </ul>
<b>4. Intellectual Property: Protection, Patent Licensing, and Commercialization</b>		
<ul style="list-style-type: none"> <li>• Commercially viable IP</li> <li>• Assessment of market viability</li> <li>• Marketing expertise</li> <li>• Inclination to patenting</li> <li>• ITSOs and peers</li> <li>• IP protection expertise (disclosure through international protection)</li> </ul>	<ul style="list-style-type: none"> <li>• Technology users/acquirers (PH and international)</li> <li>• Businesses' licensing expertise</li> <li>• Open innovation strategies</li> <li>• Entrepreneurs (PH and international)</li> </ul>	STRIDE assessed <ul style="list-style-type: none"> <li>• Patenting regime</li> <li>• IP law</li> <li>• IP enforcement</li> <li>• Court/judicial system</li> </ul>
<b>5. Startups and Spinoffs</b>		
<b>People</b>		
<ul style="list-style-type: none"> <li>• Potential entrepreneurs (pipeline)</li> <li>• Experienced entrepreneurs (existing talent)</li> </ul>	<ul style="list-style-type: none"> <li>• "Opportunities" that can be accessed (OECD definition)</li> </ul>	<ul style="list-style-type: none"> <li>• Supporting actors &amp; services</li> <li>• Angels</li> <li>• Mentors</li> </ul>
<b>Companies</b>		
<ul style="list-style-type: none"> <li>• Firm creation and growth</li> <li>• Churn (entry/exit)</li> <li>• Basic capabilities</li> <li>• Business planning</li> <li>• Execution</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunities in local supply chains for new ventures</li> <li>• Opportunities in regional/international supply chains for new ventures</li> <li>• Opportunities in local final markets (e.g., retail channels) for startups</li> </ul>	<ul style="list-style-type: none"> <li>• Venture capital</li> <li>• Incubation/acceleration</li> <li>• Business services</li> </ul> Procedural/legal aspects of startup & exit, including: <ul style="list-style-type: none"> <li>• Administrative requirements</li> <li>• Bankruptcy</li> <li>• Barriers to exit</li> <li>• University regulations</li> <li>• Cultural issues and risk appetite</li> </ul>
<b>6. Collaboration</b>		
STRIDE assessed the culture of openness, inclination to share knowledge and information if relevant to others' needs and missions, responsiveness to proposed collaborations, prevalence of peer review and other forms of open or participatory knowledge creation, and assumption of goodwill from peers and system participants.		

## APPENDIX D. 2019 ASSESSMENT CRITERIA

Ecosystem Functions	Supply	Demand	Enabling Environment
<b>1. Education and Human Capital</b> The systems and processes through which education and human capital development in support of the knowledge and research enterprise occurs			
	Education system's ability to prepare students for knowledge-intensive activities such as research. Quantity and quality of students prepared at the secondary, tertiary, and post-graduate levels	Dual demand structure: (1) demand of students and their families for research- and innovation-relevant skills and (2) demand among employers (public and private, domestic and international) for skills related to research/ knowledge creation	System regulation, particularly ability of the system to accommodate adaptation to current needs and demands. May include accreditation, results-based quality control, role of private education, professional licensure, and approval systems for new courses and curriculum, labor market information, education finance, etc.
<b>2. Research and Knowledge Creation</b> The research and knowledge creation environment			
Basic Applied Translational Policy	Researchers, graduate students, university research labs, research networks and centers of excellence, research management capabilities, corporate/business R&D, independent research entities, government research centers, international research networks including Indonesia	Quantity and sophistication of government funding agencies, domestic private-sector funders and collaborators, international private-sector funders and collaborators, international academic/foundation/multilateral funders and funding networks, donor funding	Regulatory framework; specific regulatory barriers (procurement/purchasing), institutional support systems and rules/incentives (e.g., costing of research), and inter-university networks for research collaboration; systems to enable joint/collaborative research with industry including IP ownership and distribution regime
<b>3. Commercial Pathways (Non-linear)</b> Elements and characteristics of the pathways that support the deployment of research and innovation into profitable commercial use in the national and international for-profit sector, notionally to generate innovation-induced economic growth			
Industrial Extension and Direct Technical Services Provision	Organizations providing direct technical services or knowledge translation to the commercial sector. Quality of services. Institutional and personal interest in/commitment to providing such services	Interest among market segments (SME and corporate, domestic, and international companies)	Regulations and institutional frameworks supporting provision of, payment for, and IP distribution for direct provision of technical services to companies, <i>possibly including joint/applied research</i>
Licensing and Commercial Deployment of Research-Created IP	University/institute productivity in IP generation, marketing efforts	Domestic and international licensee base usually industry	Legal framework plus supporting expertise and "intermediation" resources in the ecosystem
Spinoffs and Startups	Quantity and quality of startup activity, including entrepreneurs (e.g., level of experience and connectedness to industry) and experienced startup managers and executives (as distinct from corporate managers)	Twofold: (1) investors and potential acquirers of startups and (2) opportunities for new products and services in specific value chains (OECD definition)	Legal framework (e.g., securities and accounting law) plus supporting expertise and "intermediation" resources in the ecosystem (e.g., finance and accounting expertise). Direct intermediaries and support systems such as networks, incubators, and accelerators usually evaluated here

## APPENDIX E. COMPARATIVE SUMMARY OF FINDINGS: 2014 AND 2019

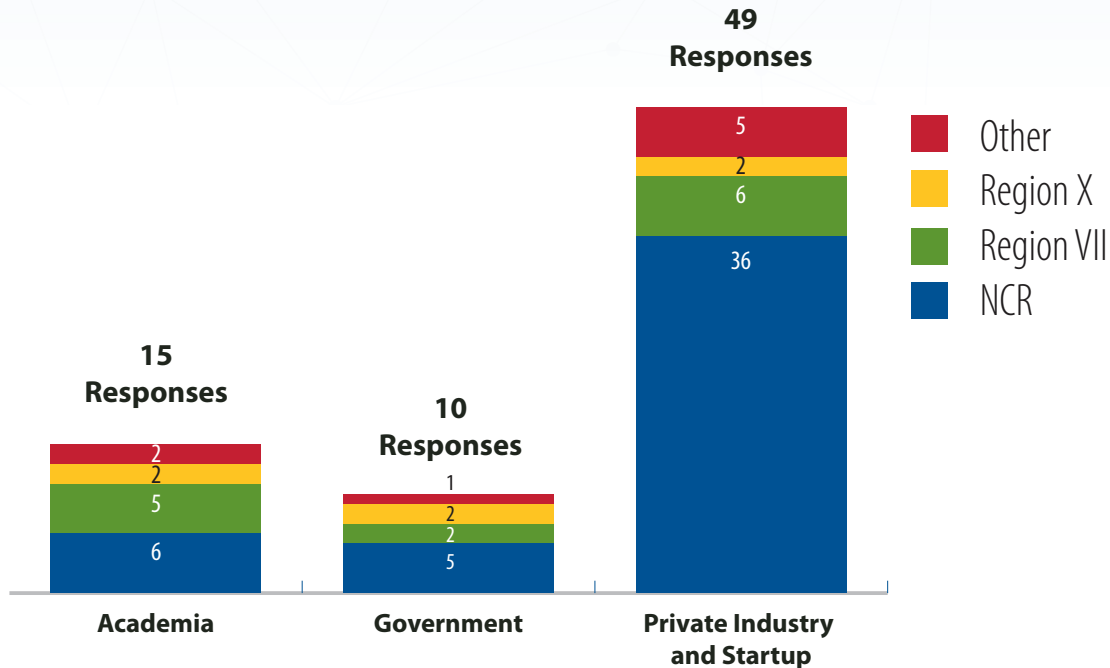
The 2014 assessment identified a few strength areas and suggested positive momentum in multiple directions, but it also pointed to several critical issues that hindered the development of the innovation ecosystem in the Philippines. A summary of the findings from 2014, most relevant to the 2019 assessment, and an update for 2019 (as shared in [CHAPTER 2](#)) are summarized in the table below.

Supply		Demand	Enabling Environment
1. Education and Human Capital			
2014	The quality of STEM-related training was acceptable by global standards, but the supply of STEM graduates exceeded local demand, leading to out-migration of skilled human capital and underemployment. The lack of STEM-centric postdoc programs in the Philippines led many graduate students to pursue programs abroad, leading to a decline in interest in STEM careers and weakened foundational skills in-country.	Stakeholders voiced concern over how the lack of research culture in universities, combined with limited opportunities for specialization, leaves students unprepared for the most demanding aspects of S&T innovation.	The perception in 2014 was that higher education was working but needed to be more aggressive in coordinating with industry to ensure the course content and professional licensing aligned with emerging technology trends.
2019	The quantity of graduates, including STEM, has increased, but the quality is still perceived to be the same. There is still a major gap between the skillset of fresh graduates and the needs of industry. Furthermore, there is still a lack of STEM-centric programs beyond the master's level. STEM-related salaries in the Philippines are low, so companies are losing talent that moves abroad.	Industry shared their perception on education being too focused on preparing students for licensing exams instead of developing real skills that match industry needs. Furthermore, although there has been some improvement in culture, academia is still more focused on academic publications than on research.	Stakeholders voiced a perceived improvement on human capital and education, albeit slow. Academia has been more proactive in seeking industry input in curricula, but government regulations on curriculum development are still a major barrier. Furthermore, policies related to bringing in foreign faculty still hinder innovation because they prevent broader diversity. Other new policies, such as the Universal Access to Quality Tertiary Education Act, are having impact on the educational ecosystem, including a large negative impact on smaller private universities. More private corporations are acquiring universities. DepEd and CHED are still slow to align with industry needs.
2. Research and Knowledge Creation			
2014	Although the perception among stakeholders was that the Philippines lacked a strong culture of research, young researchers seemed interested in and capable of important innovations, showing hope for strengthening the ecosystem.	Total demand for research as measured by public and private expenditure was rising from extremely low to a level similar to most regional peers. Even with significant advances, though, the potential supply of research still far outstrips demand and associated funding.	The university system lacked appropriate incentives, both for individuals to consider research as a career and for institutions to produce globally competitive and commercially relevant research outcomes.
2019	There has been a slight increase in government R&D funds but still well below global guidelines. Researchers lack access to the latest technologies and, in some cases, even to databases of global scientific publications (meaning they are not knowledgeable about what is happening outside of the Philippines in their domain).	Industry R&D is still low and only slowly improving. Although government funding is available to support R&D, many organizations are hesitant to access it because of the bureaucracy and the potential for auditing in the future. Large organizations that require R&D do not look for collaboration with Filipino universities, citing lack of speed, talent, and access to new technologies.	Although still a minority, a few universities are now prioritizing R&D and starting to enable faculty to do so (shifting the teaching to research load). Procurement is still a major barrier and saw no improvements in the past 5 years. Stakeholders' perspective is that S&T is a lower priority to the current administration compared with the previous administration.
3. Knowledge Transfer			
2014	With some exceptions, universities did not perceive benefit from collaboration with industry in 2014, particularly because of academia's focus on publications, prestige, and patents. The limited direct income from these activities was not seen as enough to yield interest.	Industry saw direct collaboration complicated relative to other options—principally consulting agreements with faculty—because of universities' competing priorities, unrealistic expectations of IP ownership and future patenting revenue, and burdensome administrative procedures.	Nothing in the enabling environment directly prohibited the formation of productive relationships. However, companies' interest in contributing financially to government-funded research diminished because of the perceived lack of any legally sanctioned payment mechanism to use for such contributions.

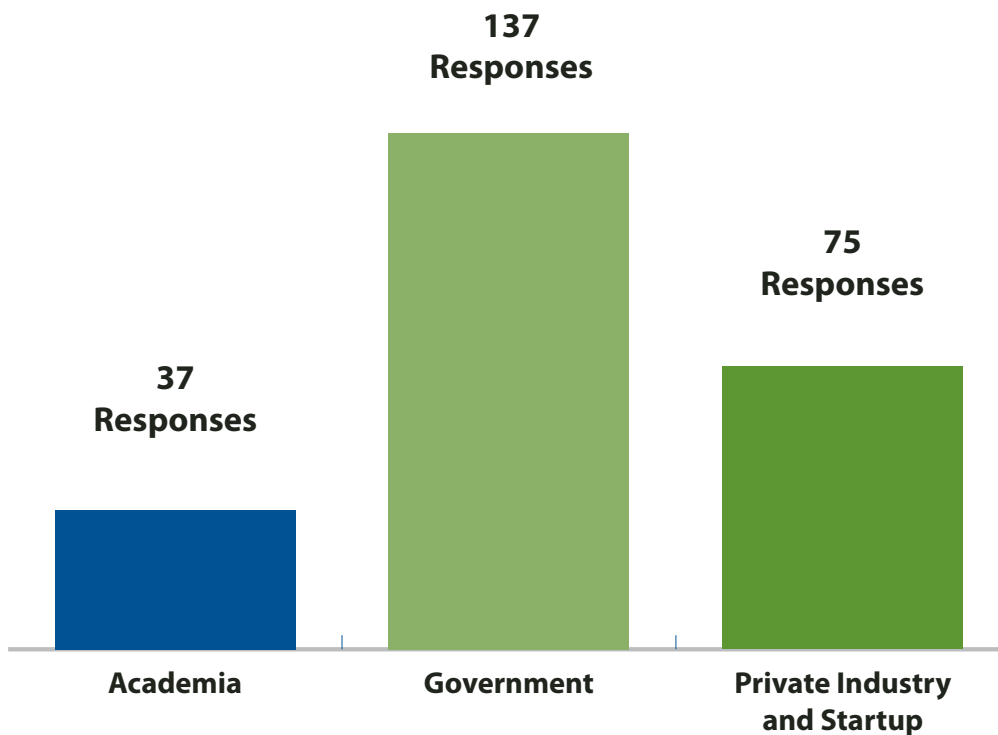
Supply		Demand	Enabling Environment
2019	There has been stronger awareness and push from government for IP protection and commercialization. However, research use still remains low. The number of universities creating or enhancing offices to provide outreach to and interact with industry has increased, but they still lack expertise to effectively market their capabilities and patent portfolios	Industry is more open to collaboration with academia today, but most engagements still happening one-on-one with faculty (e.g., consulting engagement with someone industry already knows). Industry still sees little value in R&D coming out of universities and shared that output is still not aligned with their needs	Now there is a higher number of universities with dedicated offices for knowledge transfer and collaboration. More incentives are coming from government toward commercialization of research. There is an increased awareness and focus on IP, but neither industry nor academia really understand it. Plus, there is a limited number of attorneys with real knowledge of it
4. Intellectual Property			
2014	There was an intense period of focus on IP around 2014, catalyzed by IOPHL initiatives, which expanded patenting activities and broadened awareness of the potential value of scientific discoveries that are properly protected. Yet universities lacked specialized expertise to effectively market their patent portfolios for commercial use	Local companies/industries lacked demand because of the widely expressed desire for total control of IP as an element of business strategy and because of a lack of familiarity with and trust of legal mechanisms for licensing	The regulatory environment, in most respects, was attuned to international standards, meaning it was not an obstacle to licensing; however, companies reported that they did not always trust the maintenance of confidentiality in the patenting process
2019	IP was a separate element in the 2014 assessment, whereas it was considered part of knowledge transfer in the 2019 assessment.		
5. Startups and Spinoffs			
2014	While there was a lack of experienced technology entrepreneurs and a general aversion to risk among professionals, efforts to stimulate entrepreneurship via education, startup support organizations, and corporate initiatives increased. Most startups and spinoffs were concentrated in Metro Manila and Cebu	There is rapidly growing demand from venture capitalists and Philippine conglomerates for profitable technology startups and spinoff companies, outstripping the supply	Finance, mentoring, matchmaking and incubation, necessary enabling factors, were improving rapidly through strategic efforts of domestic and international stakeholders; however, basic business regulation was still an issue, and many startup-specific business services and expertise necessary to grow the startup ecosystems remained absent
2019	There has been an increase in the number of startups being created, but little improvement on the quality of these ventures. A lot of them are copies of what is going on outside the Philippines, and most are still concentrated in Metro Manila and Metro Cebu. Although there has been more push for education related to entrepreneurship, there has been limited impact from those efforts. Culturally, Filipinos are risk averse, and families are still telling students to work for a large corporation instead of starting a company	More conglomerates are supporting startups, but collaboration is still limited between large companies and startups. SMEs are more open to collaboration with startups now. Government has increased efforts toward enabling growth of the startup ecosystem, including resources and new policies being introduced, but the impact of these efforts is still to be felt as those efforts are very recent	Angel investors in the Philippines are very conservative. There are more funds available, but only at seed or established stages. There is a gap in the middle. More support organizations and money are available. Ease of doing business is still a challenge for startups, but newly signed laws promise to lower barriers. Startups still feel the need to go outside of the Philippines to find investment and expertise, and many are registering businesses outside the country because of the high regulatory barriers that still exist. The established financial system is not built for startups
6. Collaboration			
2014	In 2014 there were pockets of excellent collaboration among high-level business, government, and university executives, within specific professions and networks, and among returned (Balik) scientists, entrepreneurs, and executives, and among organizations engaged in entrepreneurship support	Collaboration appeared to be more routine to stakeholders outside of NCR; however, the national innovation ecosystem, characterized by widespread mutual mistrust between university and industry communities and more competition than collaboration, perhaps reflects the historic conglomerate structure of the Philippine economy	Many stakeholders described government agencies as being preoccupied with bureaucratic competition to the detriment of collaboration and resource sharing. There was significant friction in the innovation ecosystem because of these factors, which limited the growth of innovative research and businesses
2019	There has been improvement in collaboration between academia and industry, but academia's perception of improvement is much higher than industry's. Industry's feedback is that there is still limited awareness of what academia is doing or what they can offer. Government-academia collaboration is also better but may be too focused on academia. Government-industry collaboration has seen limited improvement. Individual relationships are still driving collaboration in an ad hoc manner versus taking a programmatic approach.	Stakeholders agreed that there is more awareness and acceptance of the need for collaboration to drive the ecosystem forward. There is more openness to working together and more proactive steps to request input, especially from academia. However, most academia-industry collaboration is focused on human capital development and little on R&D. Although some pockets are still siloed and view the ecosystem from a more competitive lens, there has been a shift to more cooperation in the ecosystem and intentionality in aligning efforts.	Although there is more coordination and alignment, siloes are still prevalent within government. The majority of industry stakeholders voiced a lack of awareness of what is happening in the ecosystem, what academia is doing, or what capabilities and resources are available from both academia and government. There is still significant friction due to regulatory barriers, which hinders further growth of the ecosystem. Furthermore, industry still perceives a mismatch in pace between industry needs and academia efforts, which hinders collaboration.

## APPENDIX F. ANALYSIS GRAPHICS: 2019

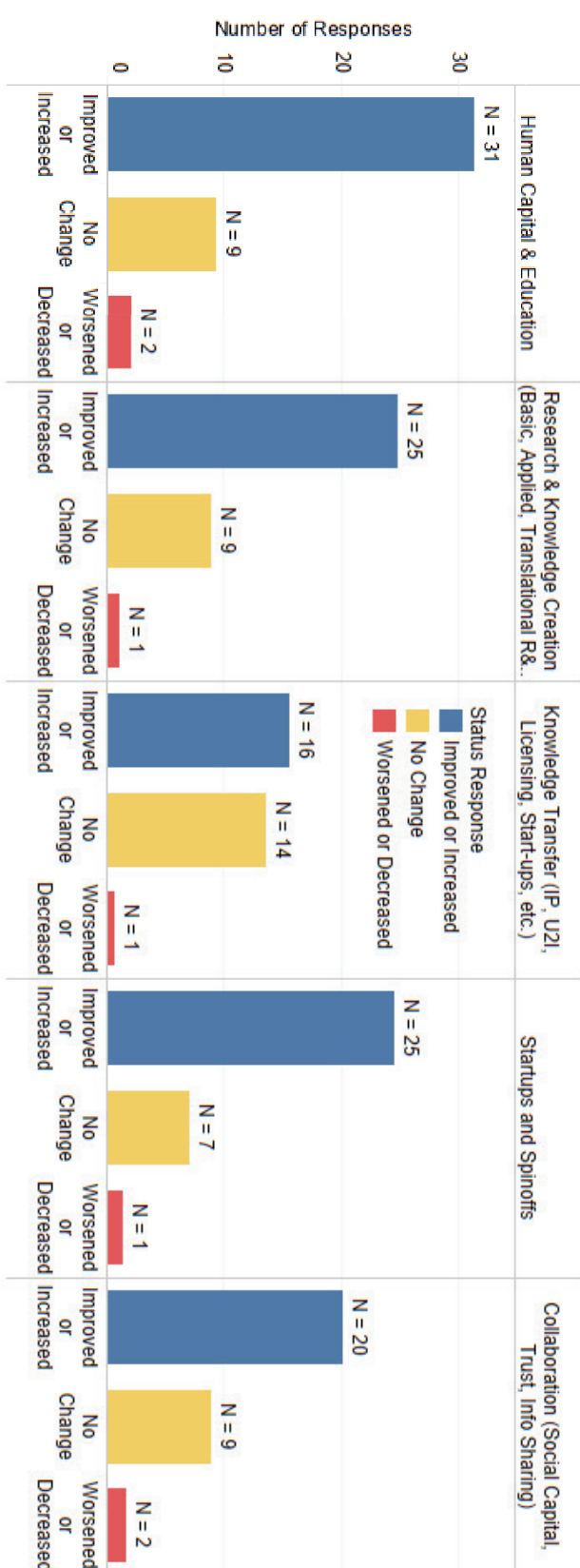
Although there was representation from stakeholders from various regions, industry participants from NCR were dominant.



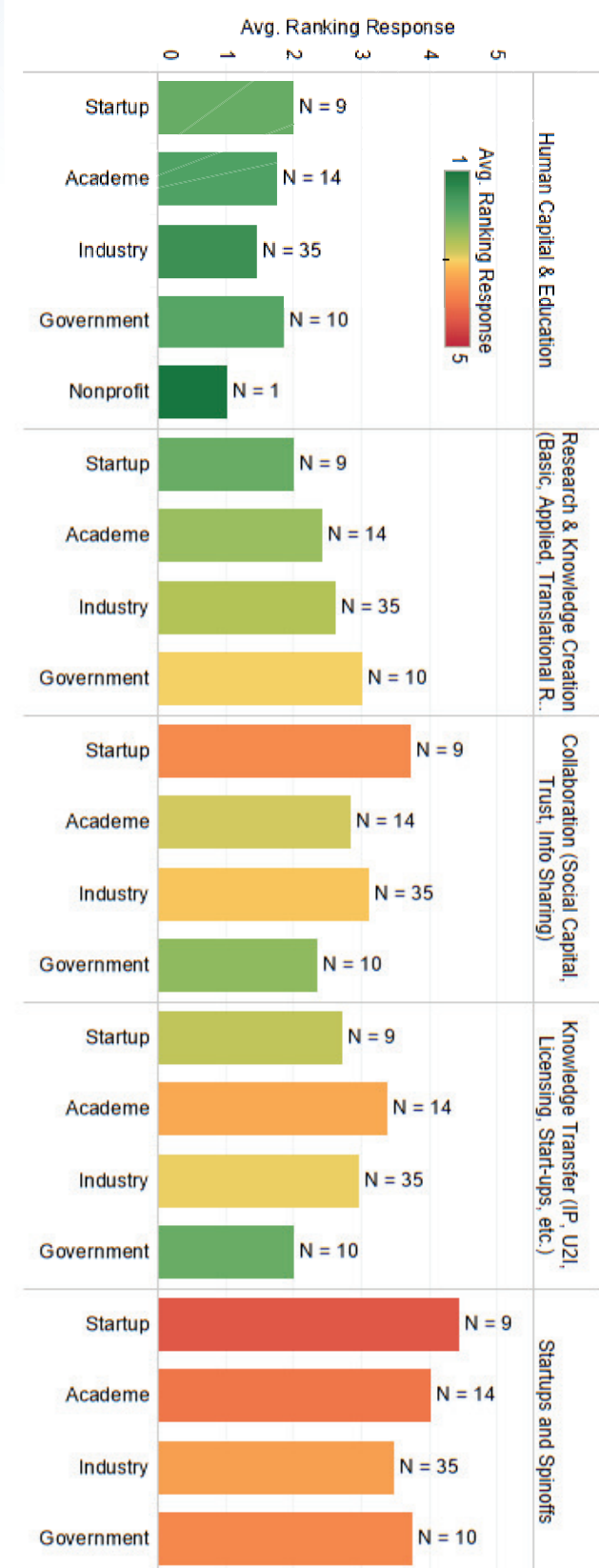
The majority of survey responses came from government. Respondents were not asked to disclose geography.



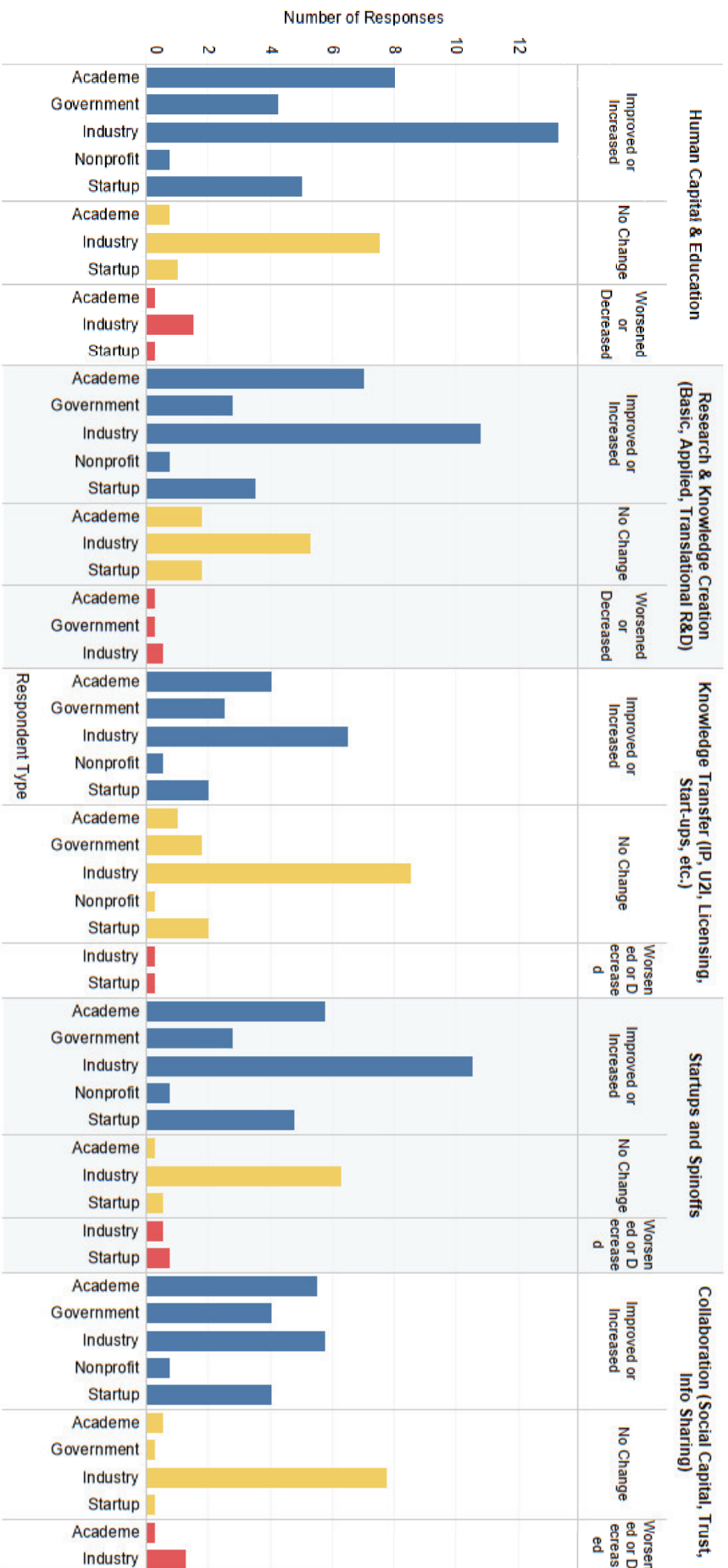
## Status Responses




## Ranking Responses



## Status Responses



A stylized world map in the background, rendered in various shades of blue, green, and orange. Overlaid on the map is a network of thin white lines connecting small dots, which are also colored in blue, green, and orange. The dots and lines are more prominent in the upper left and lower right corners of the image.

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